The PHOTOFACT Servicer

SET 440 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAY 1, 1959

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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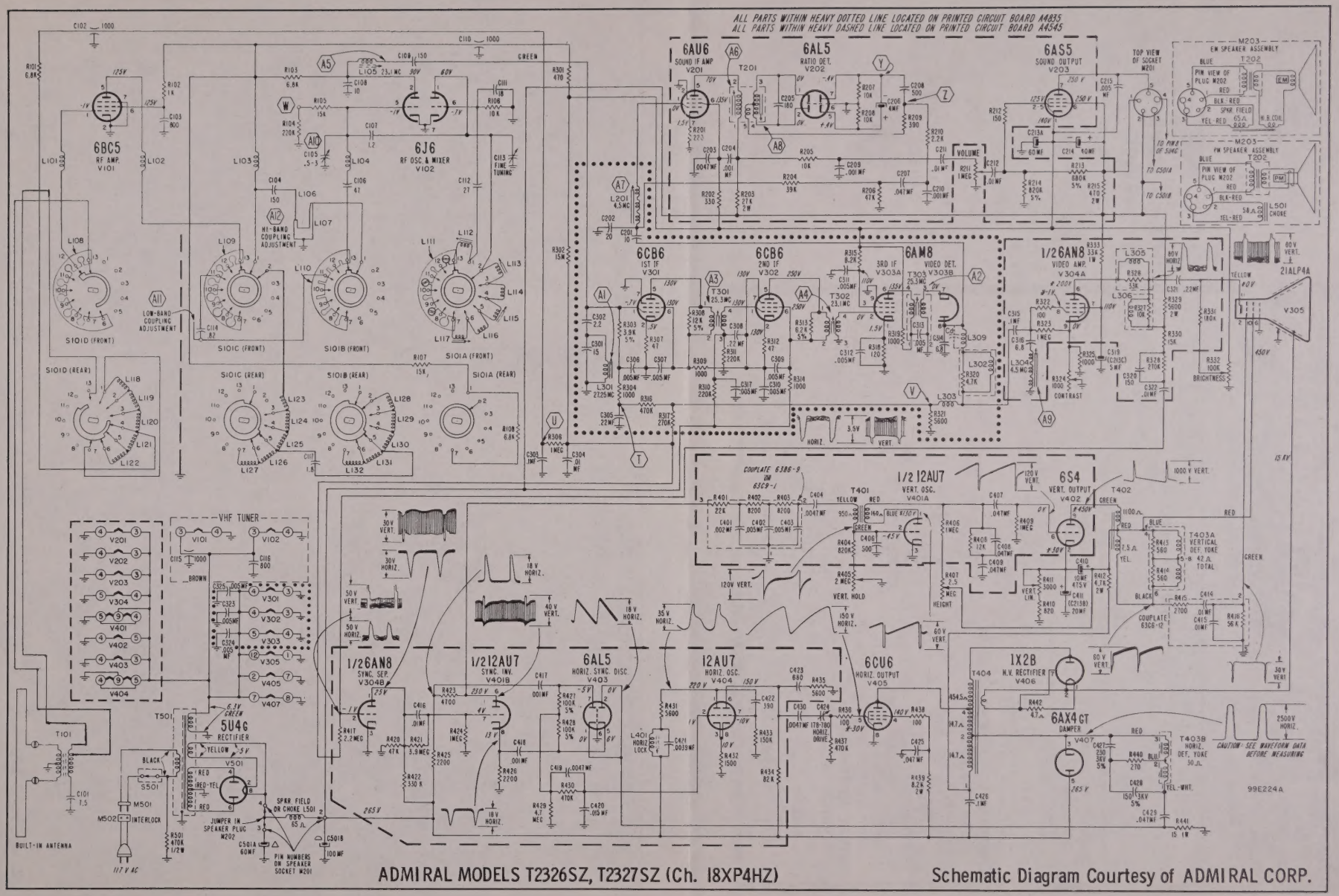
T2326SZ
T2327SZ
(Ch. 18XP4HZ)

CROSLEY
T-31BK, T-31CU, T-31GN,
T-31GY, T-31RD, T-31Y (Ch. 31T)


ALL PARTS WITHIN HEAVY DOTTED LINE LOCATED ON PRINTED CIRCUIT BOARD A4835
ALL PARTS WITHIN HEAVY DASHED LINE LOCATED ON PRINTED CIRCUIT BOARD A4545
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6J6 RF OSC. & MIXER V102
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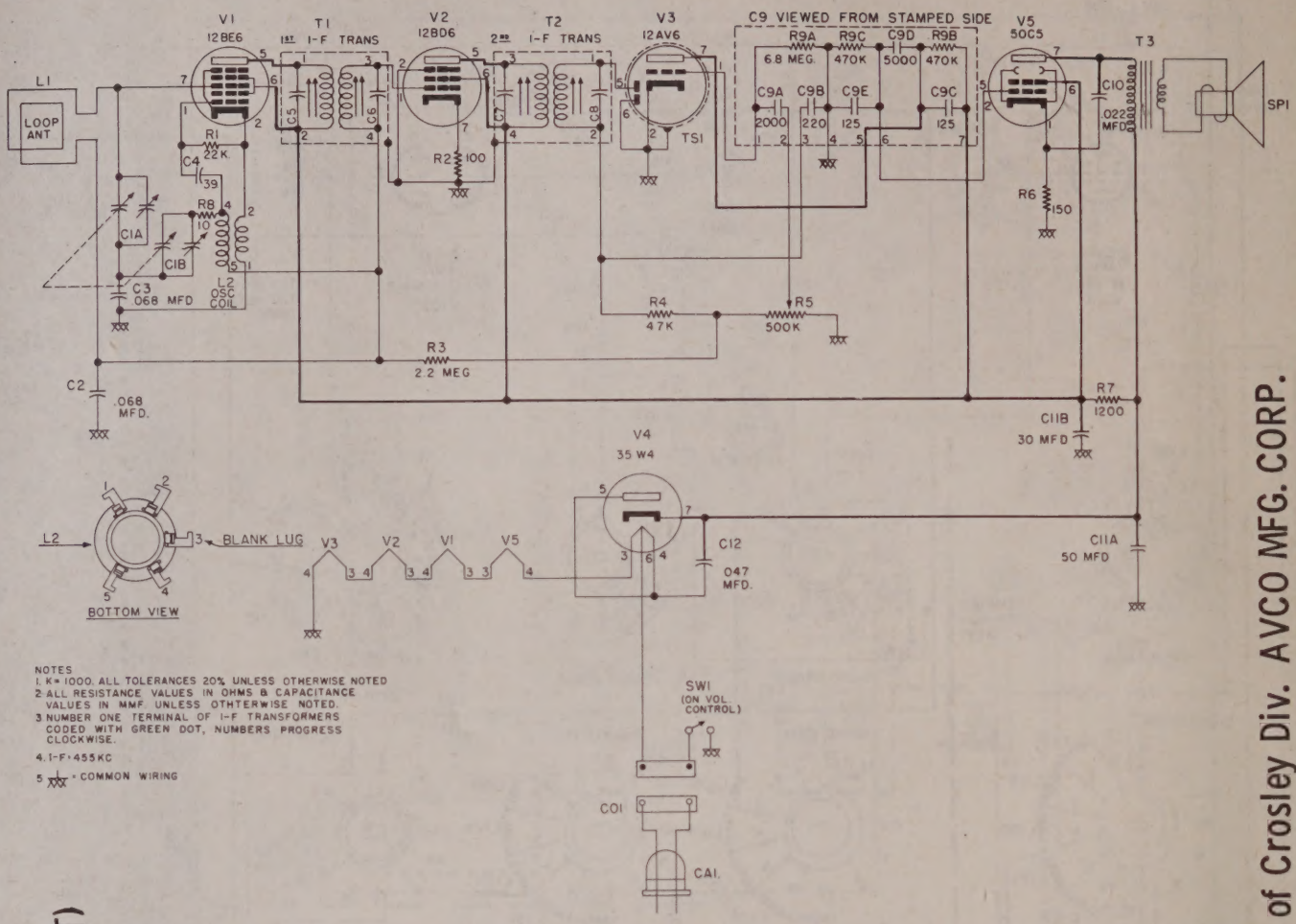
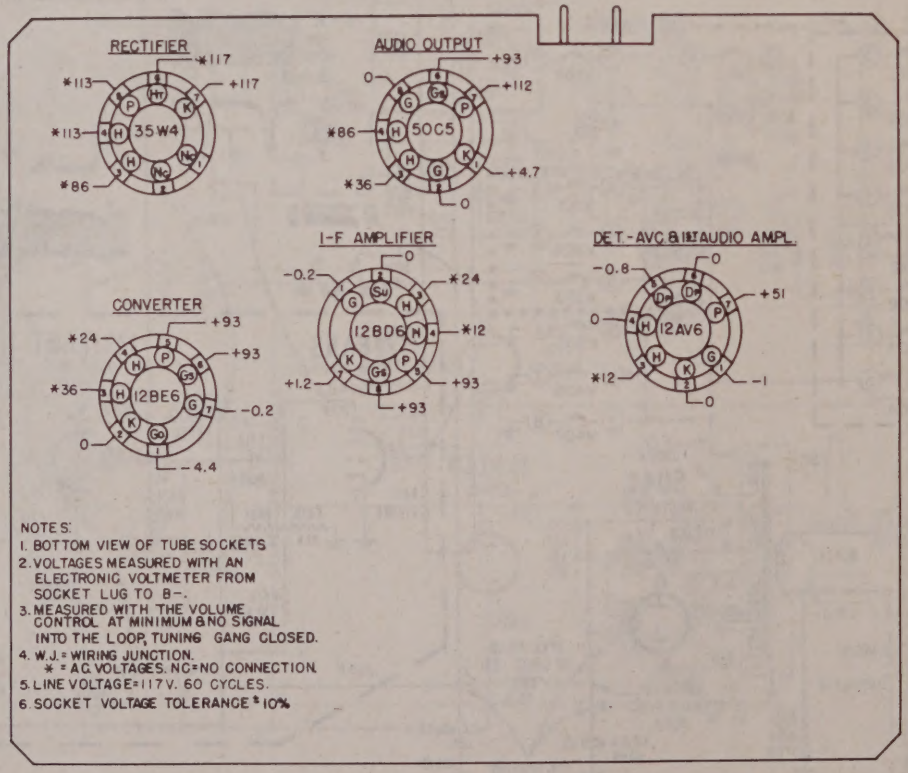
6AL5 RATIO DET. V202
6AS5 SOUND OUTPUT V203
6CB6 1ST IF V301
6CB6 2ND IF V302
6AM8 3RD IF V303A VIDEO DET. V303B
1/26AN8 VIDEO AMP. V304A
21ALP4A
1/26AN8 SYNC. SEP. V304B
1/212AU7 SYNC. INV. V401B
6AL5 HORIZ. SYNC. DISC. V403
12AU7 HORIZ. OSC. V404
6CU6 HORIZ. OUTPUT V405
1/2 12AU7 VERT. OSC. V401A
6S4 VERT. OUTPUT V402
1X2B H.V. RECTIFIER V406
6AX4 GT DAMPER V407
5U4G RECTIFIER V501
VHF TUNER
M203 FM SPEAKER ASSEMBLY T202
M203 PM SPEAKER ASSEMBLY T202
T403A VERTICAL DEF. YOKE
T403B HORIZ. DEF. YOKE
L501 CHOKE
S501 M501 M502 INTERLOCK
BUILT-IN ANTENNA
117 V AC
SPKR FIELD OR CHOKE L501
JUMPER IN SPEAKER PLUG M202
PIN NUMBERS ON SPEAKER SOCKET M201
TOP VIEW OF SOCKET M201
CAUTION - SEE WAVEFORM DATA BEFORE MEASURING
99E224A

ADMIRAL MODELS T2326SZ, T2327SZ (Ch. 18XP4HZ)

Schematic Diagram Courtesy of ADMIRAL CORP.



NOTES
1. K = 1000. ALL TOLERANCES 20% UNLESS OTHERWISE NOTED
2. ALL RESISTANCE VALUES IN OHMS & CAPACITANCE VALUES IN MMF UNLESS OTHTERWISE NOTED.
3. NUMBER ONE TERMINAL OF I-F TRANSFORMERS CODED WITH GREEN DOT, NUMBERS PROGRESS CLOCKWISE.
4. I-F = 455 KC
5. ⏚ = COMMON WIRING



NOTES:
1. BOTTOM VIEW OF TUBE SOCKETS
2. VOLTAGES MEASURED WITH AN ELECTRONIC VOLTMETER FROM SOCKET LUG TO B−.
3. MEASURED WITH THE VOLUME CONTROL AT MINIMUM & NO SIGNAL INTO THE LOOP, TUNING GANG CLOSED.
4. W.J. = WIRING JUNCTION.
   * = A.C. VOLTAGES. NC = NO CONNECTION.
5. LINE VOLTAGE = 117 V. 60 CYCLES.
6. SOCKET VOLTAGE TOLERANCE ± 10%

SOCKET VOLTAGE CHART

CROSLEY MODELS T-31BK, T-31CU, T-31GN, T-31GY, T-31RD, T-31IY (Ch. 31T)

Schematic Diagram Courtesy of Crosley Div. AVCO MFG. CORP.

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

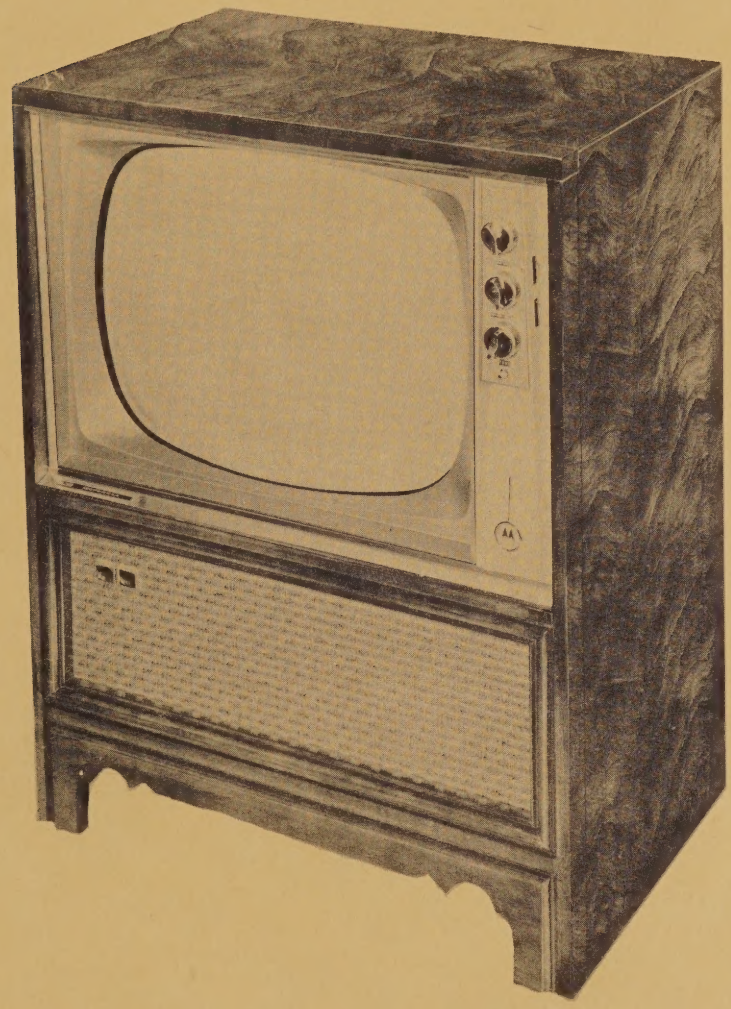
MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89



MODEL 21K100MA (Ch. RTS-544)

MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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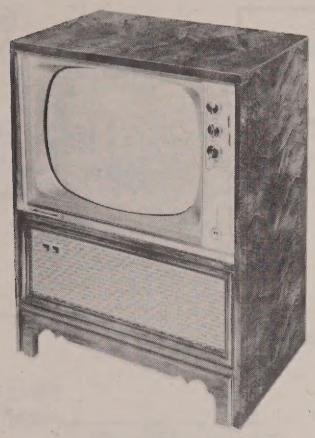
MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 wood screws holding rear cover.
2. Remove 2 screws holding stereo receptacle plug in jack to rear cover. Remove rear cover.
3. Remove 3 plugs to tuner bracket and speaker leads.
4. Remove 4 bottom chassis bolts.
5. Remove chassis.
6. Remove 4 push on type knobs from the front.
7. Inside cabinet locate actuating lever on control bracket.
8. Remove 3 metal screws holding control bracket to cabinet.
9. Carefully pull bottom of control bracket rearward to clear Tone knob from opening. Move control bracket SLIGHTLY to the right to clear retaining tab at the top and remove bracket.



MODEL 21K100MA (Ch. RTS-544)

TRADE NAME	Motorola	MODELS	CHASSIS
		A21K95M	NTS-544
		A21K103B, M, MC, 21K103B, BA, CW, CWA, M, MA, MC, MCA, 21K106B, M, 21T60BG, CH, MG	QTS-544
		21K98B, BA, M, MA, W, WA, 21K100B, BA, M, MA, 21K101B, BA, M, MA, W, WA, 21K102CW, CWA, 21T58BG, BGA, CH, CHA, MG, MGA, 21T61B, BA, M, MA	RTS-544
		Y21K98B, BA, M, MA, W, WA, Y21K101B, BA, M, MA, W, WA, Y21K103B, BA, CW, CWA, M, MA, MC, MCA, Y21T58BG, CH, CHA, MG, MGA, Y21T61B, BA, M, MA	RTS-544Y
		21K95B, M	STS-544
		Y21K95B, M	STS-544Y
		21K106B, M, 21T60BG, CH, MG ..... Remote Control	TR-3
		A21K103B, M, MC, 21K103B, BA, CW, CWA, M, MA, MC, MCA ..... Remote Control	TR-4
		A21K95M ..... Remote Control	TR-89

MANUFACTURER Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET Television Receiver (Some equipped with Remote Control)
TUBES VHF-Nineteen, UHF-Twenty
POWER SUPPLY 110-120 Volts AC, 60 Cycle RATING 210 Watts, 1.8 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 9 o'clock. Proceed in a counterclockwise direction adjusting for best picture and sound.

SAFETY GLASS REMOVAL

Remove 5 wood screws holding metal trim at top of safety glass. Move top of glass outward and lift to remove.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10, or 6 and 1.

WIDTH

The width may be varied by menas of Horizontal Size control. (For location, see tube placement chart.)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

Two fuses are used for low voltage power supply protection, and a fuse wire for filament protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PIN CUSHION CORRECTION

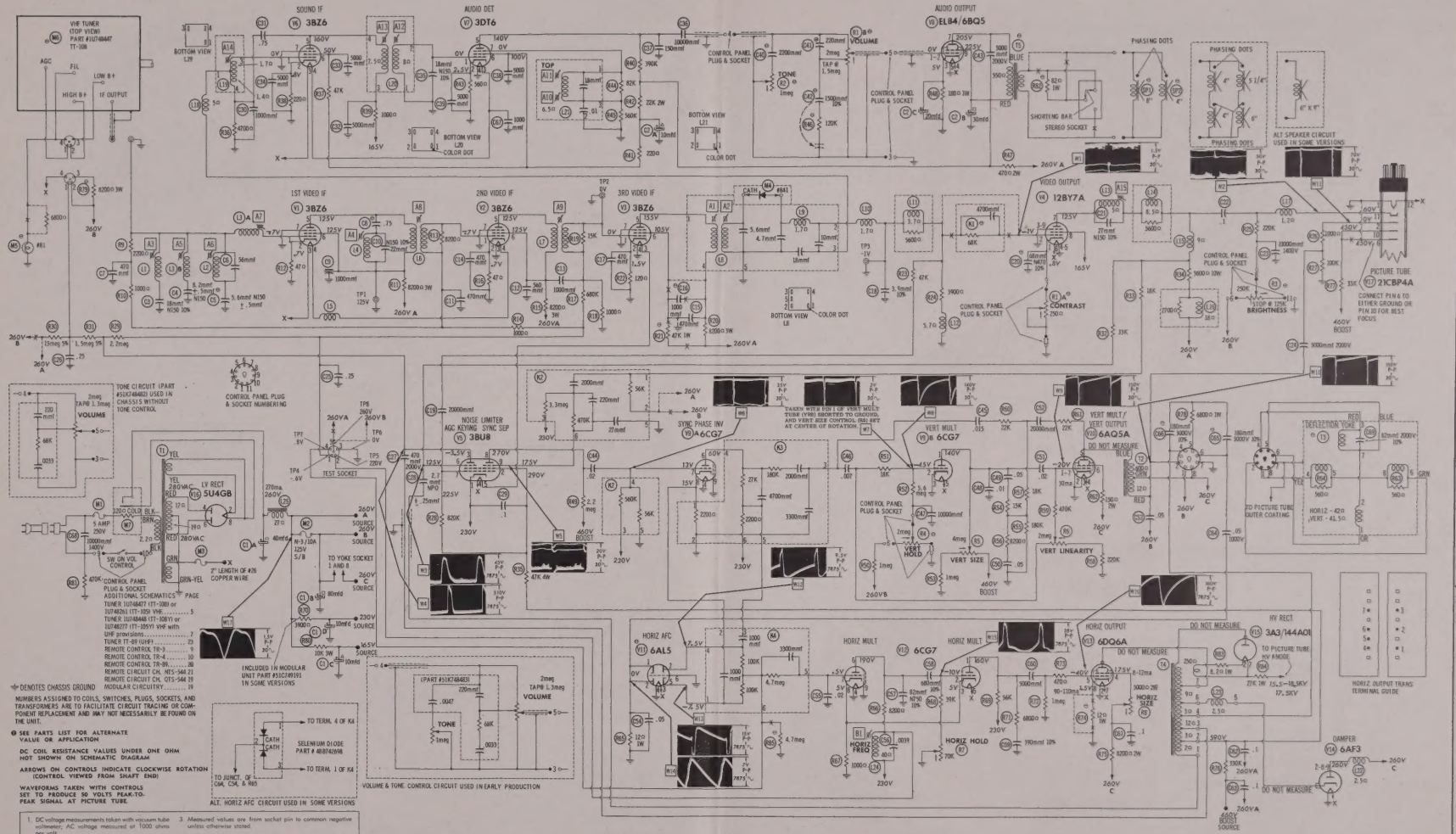
Reduce the picture size so that the sides of the raster are visible. Position 2 magnets so that all sides are straight.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

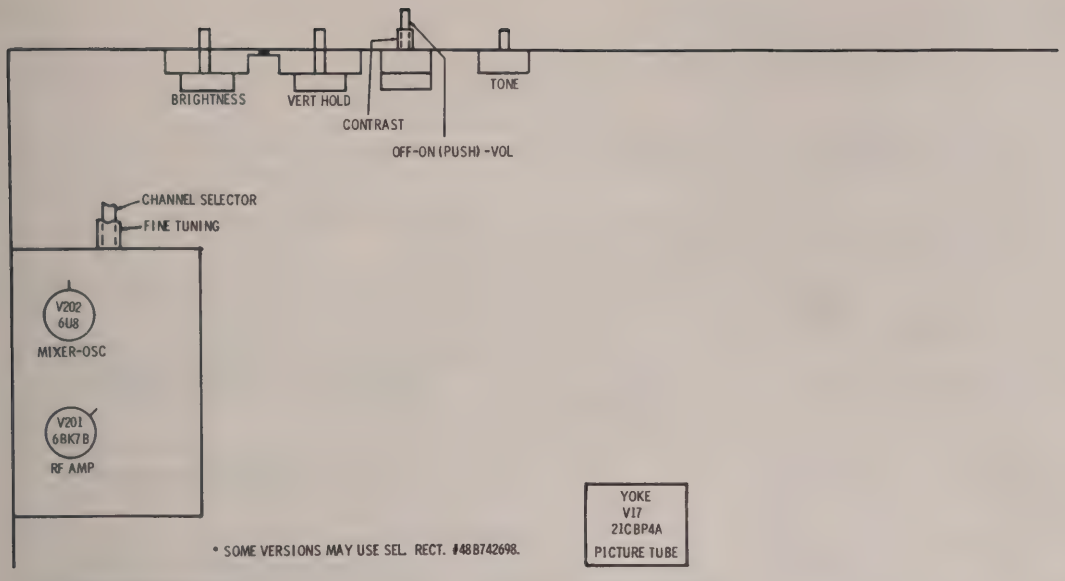
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

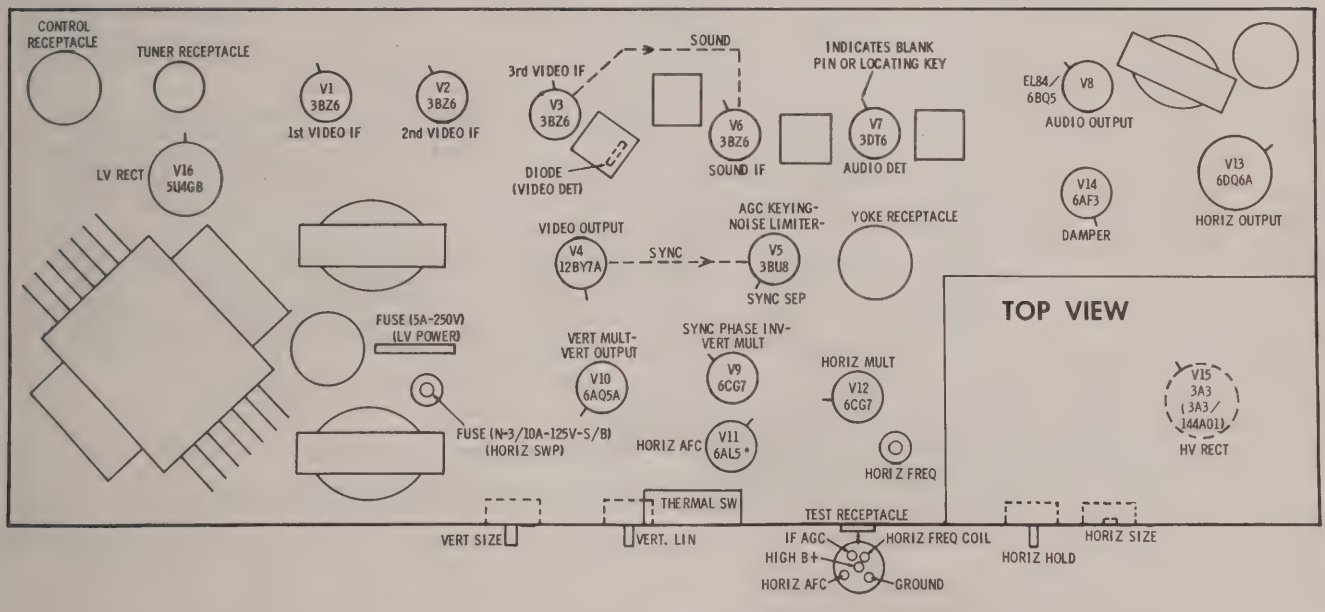
MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89

SET 440 FOLDER 1


VHF TUNER (TOP VIEW) PART #10748447 TT-108
SOUND IF V6 3BZ6
AUDIO DET V7 3DT6
AUDIO OUTPUT V8 EL84/6BQ5
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3BZ6
VIDEO OUTPUT V4 12BY7A
NOISE LIMITER AGC KEYING SYNC SEP V5 3BU8
SYNC PHASE INV V9 6CG7
VERT MULT V10 6CG7
VERT MULT/ VERT OUTPUT V16 6AQ5A
LV RECT V16 5U4GB
HORIZ AFC V11 6AL5
HORIZ MULT V12 6CG7
HORIZ MULT V13
HORIZ OUTPUT V15 6DQ6A
HV RECT V15 3A3/144A01
DAMPER V14 6AF3
PICTURE TUBE V17 21CBP4A
CONTROL PANEL PLUG & SOCKET
PHASING DOTS
ALT SPEAKER CIRCUIT USED IN SOME VERSIONS
TONE CIRCUIT (PART #51K748623 USED IN CHASSIS WITHOUT TONE CONTROL
CONTROL PANEL PLUG & SOCKET NUMBERING
TEST SOCKET
SW ON VOL CONTROL
INCLUDED IN MODULAR UNIT PART #51C749191 IN SOME VERSIONS
SELENIUM DIODE PART # 48B742698
ALT. HORIZ AFC CIRCUIT USED IN SOME VERSIONS
VOLUME & TONE CONTROL CIRCUIT USED IN EARLY PRODUCTION
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1959
MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89

TUBE PLACEMENT CHART





MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4 TR-89

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

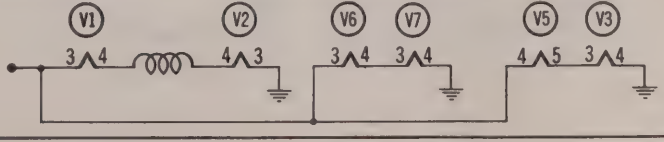
POWER SUPPLY FAILURE
No raster, no sound Fuse (5A), Fuse Wire (F11), Fuse (3/10A), V16

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15, V17, V16
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V12, V13, V14
Narrow picture V12, V13, V14, V16
Vert. off freq. V9, V10
Horiz. off freq. V12

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det), V5
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V17
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V9
No horiz. sync V5, V9, V11
No vert. or horiz. sync V5, V9

NOTE: Some filaments are wired in series parallel. Failure in the filament of one circuit may affect another circuit.



FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Remove Deflection yoke plug to eliminate RF interference from the Horizontal Sweep circuit. Connect a 155Ω 50 watt resistor from TP-8 to TP-6. (CAUTION: TP-8 has B plus voltage on it.)
Disable the tuner oscillator by shorting the Oscillator grid (V202) to chassis.
Set the Contrast fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 6 volt bias supply to TP-4. Positive to chassis.
Maintain between 2 and 5 volts peak to peak on the scope except where otherwise noted in the procedure.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Peak with maximum core separation.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3, A4	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil form away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end nearest chassis.
4.	"	"	"	39.75MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil form away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil & A7	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affects the two outside peaks. Tune slug at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. thru 47K to TP-3. Low side to chassis.	A8, A9	Adjust A8 to place 42.25MC marker at 50% as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch A8 and A9 for correct response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for a normal picture and sound.
Connect the DC probe of a VTVM to point (A). Common to chassis. A10 is a preset slug which should be set near the top of the coil form and left there. Adjust A11 for maximum deflection choosing the one of two peaks that produces the highest voltage. While listening to the sound, retouch A11 for maximum sound with MINIMUM distortion.
Change to a weak signal (this may be done by loosely coupling the antenna leads to the receiver terminals) that produces a hiss in the sound. Adjust A12 and A13 for maximum sound and MINIMUM distortion. Adjust A14 for maximum undistorted sound. If the sound is not clear at the point, repeat entire procedure.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and set the Contrast fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A15 to find the two points at which the beat pattern is just visible on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.)

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6 & 23
REMOTE CONTROL ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 8 & 21

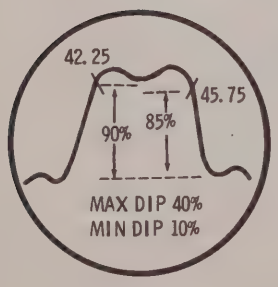


FIG.1

FIG.2

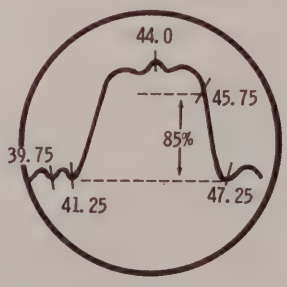


FIG.3

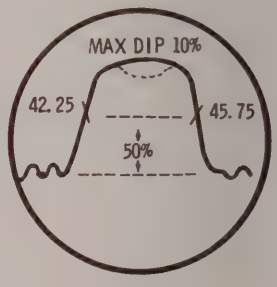
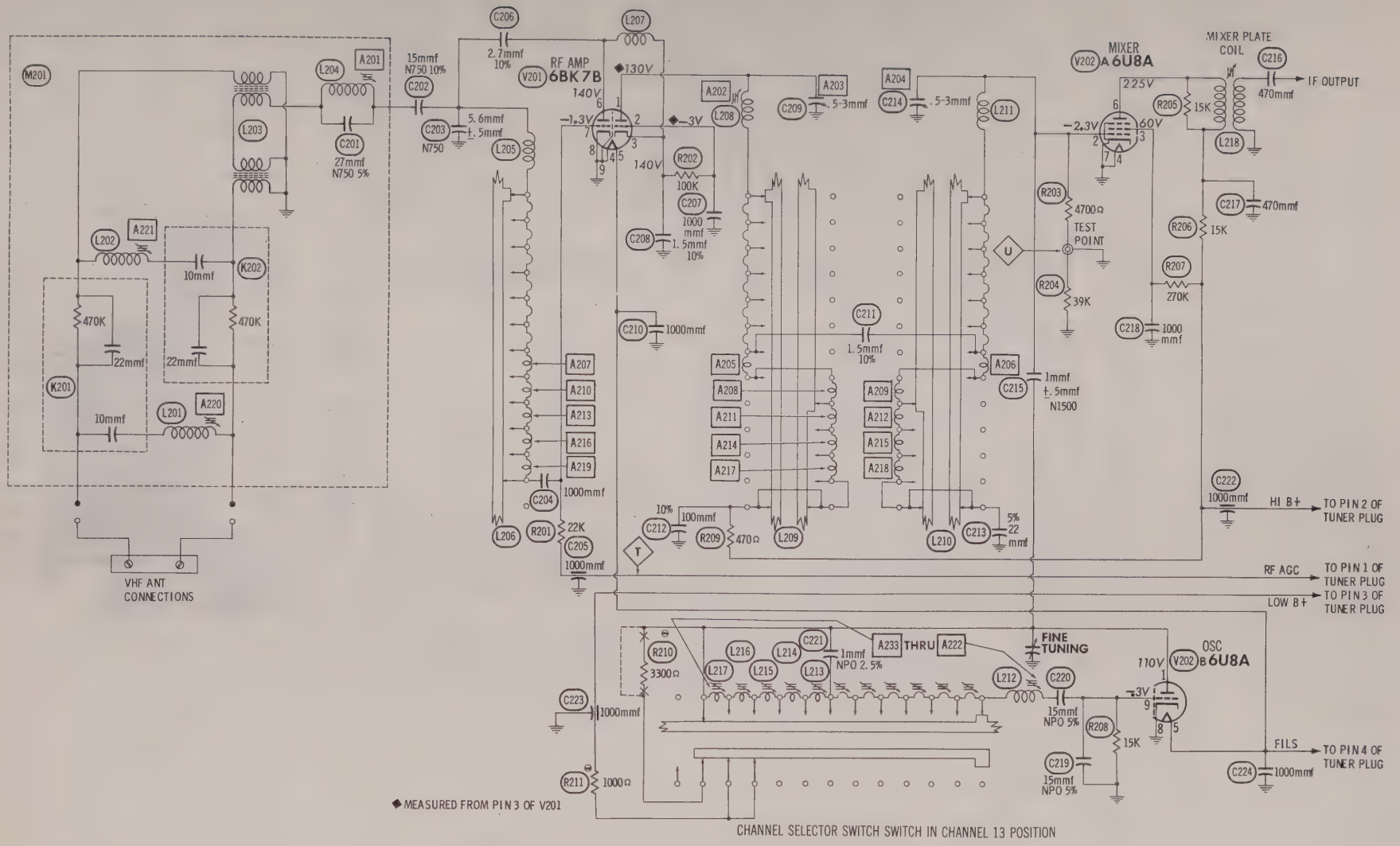


FIG.4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 1U748447 (TT-108), 1U748261 (TT-105)

MOTOROLA CHASSIS NTS-544, GTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS FOR TUNER TT108, TT108Y

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Remove yoke plug to prevent interference radiation. Connect a 1500Ω 50 watt resistor from pin 1 of yoke socket to chassis.

Suggested Alignment Tools:

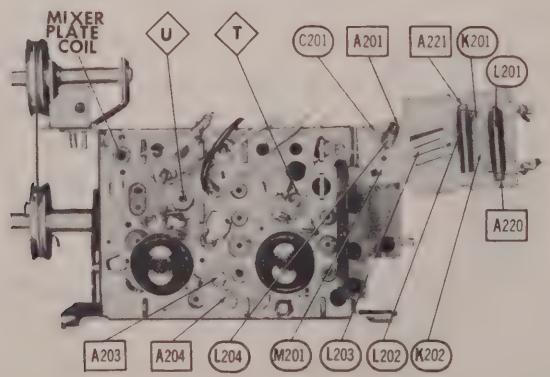
A201, A220, A221	GENERAL CEMENT #9296, 9297 WALSCO #2546, 2547
A202	GENERAL CEMENT #9050L, 9150 WALSCO #2521
A203, A204	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A222 thru A233	GENERAL CEMENT #8607, 9291 WALSCO #2520, 2522, 2523, 2524, 2537
Mixer Plate Coil	GENERAL CEMENT #8282, 8606, 8606L, 9091 WALSCO #2526, 2541, 2543, 2544

VHF RF AND MIXER ALIGNMENT

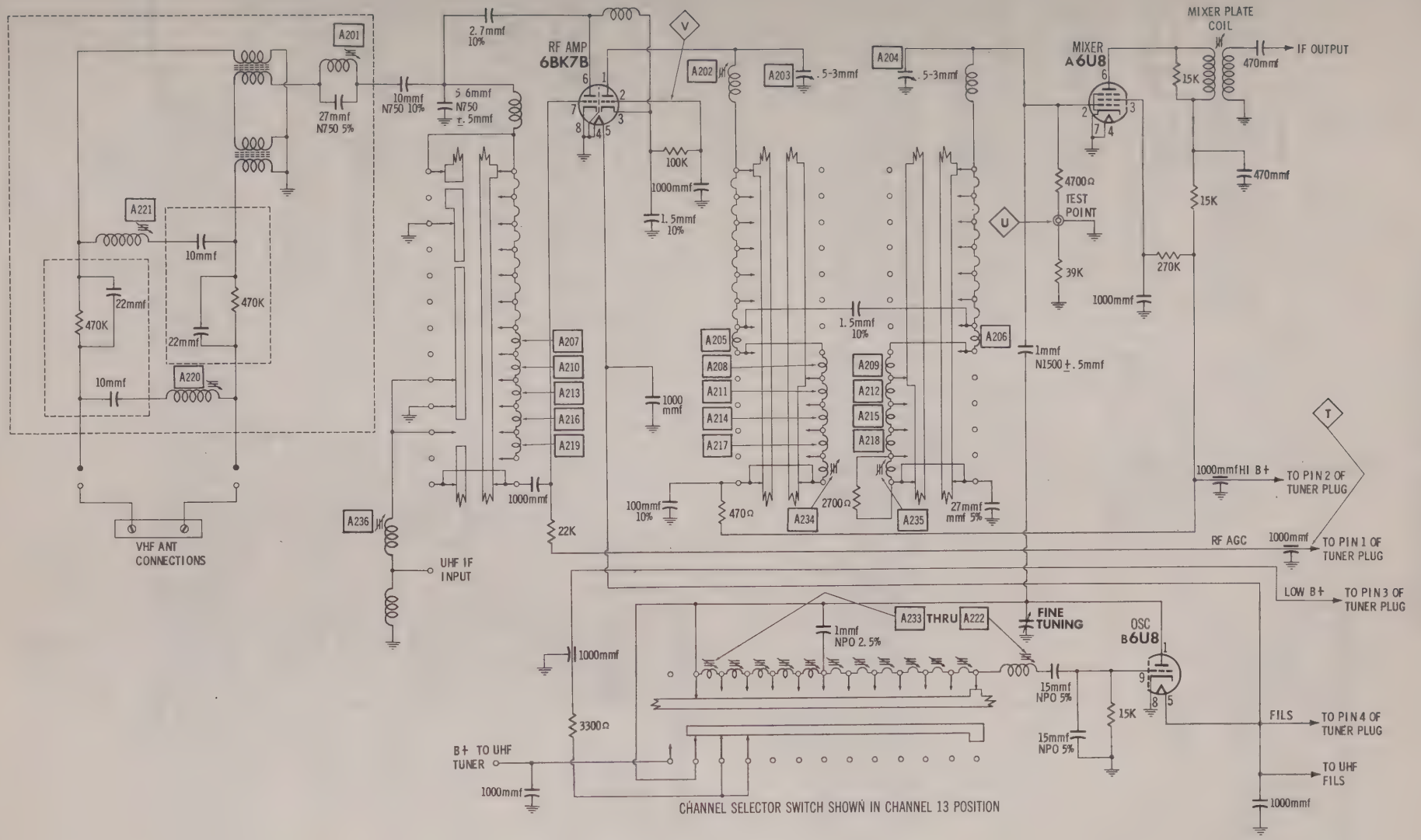
Connect a clip lead from point (T) to chassis.
Remove the tuner shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	94MC	94MC	6	Vert. Amp. thru 47K to point (U). Low side to chassis.	A201	Adjust for MINIMUM response at 94MC marker.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A202	Preset A203 and A204 to mid-range. Adjust A202 for maximum gain and symmetry similar to Fig. 201.
3.	"	"	177MC	175.25MC 179.75MC	7	"	A203, A204	Adjust for maximum gain and symmetry of response similar to Fig. 201 with markers as shown.
4.	"	"	85MC	83.25MC 87.75MC	6	"	A205, A206, A207	Adjust in numerical order for response similar to Fig. 202. First two adjustments are for proper placement of markers. Third adjustment is for maximum gain and symmetry.
5.	"	"	"	"	"	"	A201	Adjust SLIGHTLY above point where is begins to affect response curve at sound marker.
6.	"	"	79MC	77.25MC 81.75MC	5	"	A208, A209, A210	Adjust in numerical order for response similar to Fig. 202. First two adjustments are for proper placement markers. Third adjustment is for maximum gain and symmetry.
7.	"	"	69MC	67.25MC 71.75MC	4	"	A211, A212, A213	"
8.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215, A216	"
9.	"	"	57MC	55.25MC 59.75MC	2	"	A217, A218, A219	"
10.	"	"	57MC	43.5MC 45.5MC	2	"	A220, A221	Adjust for A220 MINIMUM response at 43.5MC marker and A221 for MINIMUM response at 45.5MC marker. Retouch either or both for flat response with MINIMUM amplitude at marker.

continued PAGE 23



TUNER 10748447 —TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER with UHF provisions 1U748448 (TT-108Y), 1U748277 (TT-105Y)

MOTOROLA CHASSIS NTS-544, GTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89

REMOTE CONTROL
ALIGNMENT INSTRUCTIONS

REMOTE CONTROL RECEIVER ALIGNMENT TR-3

Unplug the microphone.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to microphone input. Low side to chassis.	40KC (300 microvolts output)		DC probe thru 470K to pin 1 of the Service Test Receptacle. Common to pin 2 of the Test Receptacle.	A1 (Top slug)	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Use zero point with slug farthest from chassis.
2.	"	"	"		DC probe thru 470K to pin 3 of Service Test Receptacle. Common to chassis.	A2 (Bottom slug)	Adjust for maximum negative voltage. Set generator output to provide -15 to -25 volts on VTVM. Use maximum nearest chassis.
3.	"	"	"		"	A3	Adjust for maximum negative voltage. Set generator output to provide -15 to -25 volts on VTVM. Use peak farthest from chassis.
4.	"	"	"		"		Adjust generator output for -20 volts on VTVM.
5.	"	"	"		DC probe thru 470K to pin 4 of Service Test Receptacle. Common to chassis.	A4	Adjust for MINIMUM negative voltage. Resonate core away from chassis. Repeat step 1.

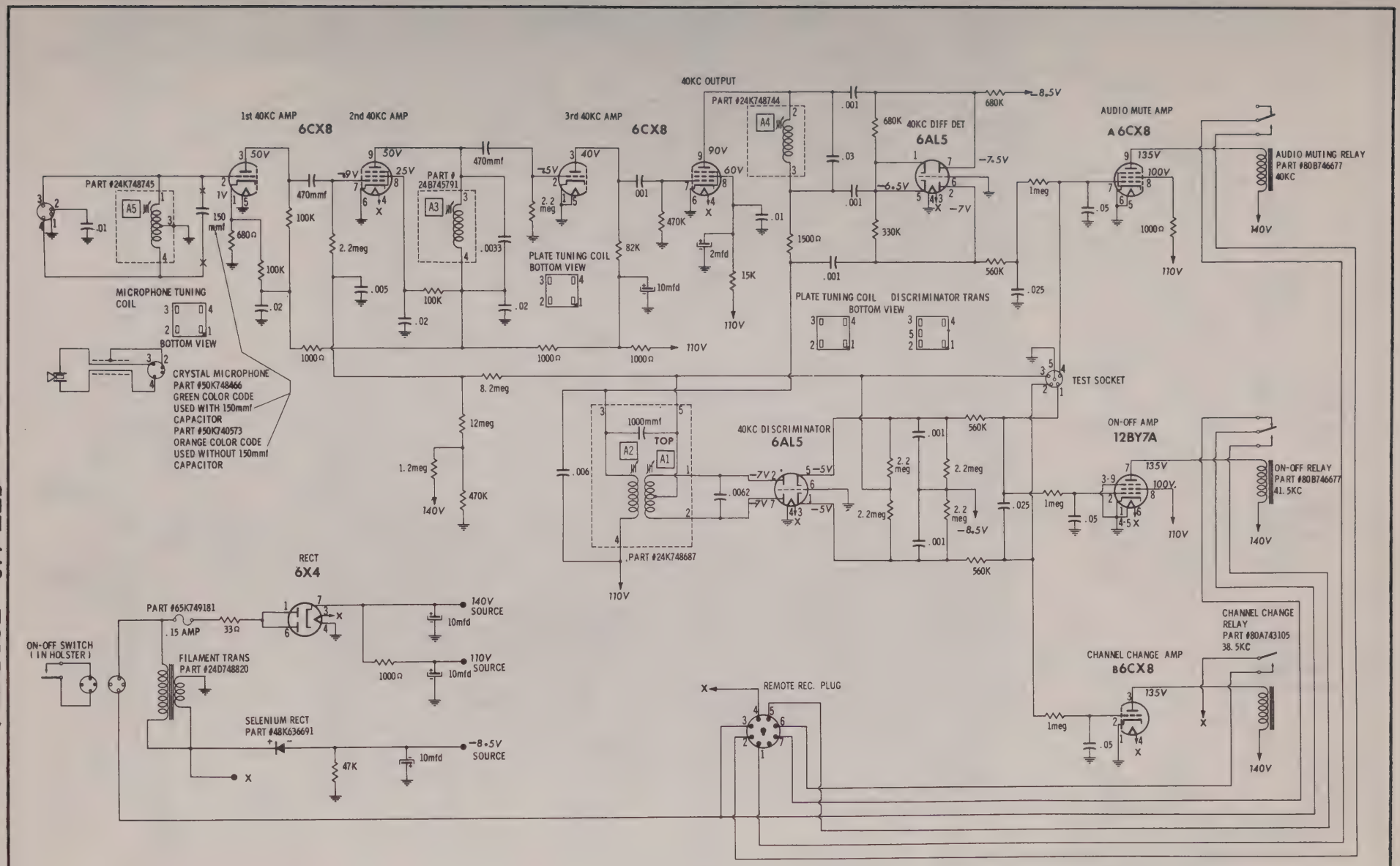
NOTE: A5 has not been adjusted at this time. Due to the additional equipment requirements, it is normally adjusted only at the factory. Therefore, adjustments of A5 should only be made if the coil has been replaced or tampered with. Remove the signal generator and plug the microphone back into its socket. Connect either a high impedance AC meter (capable of reading .1 volt) or an oscilloscope thru a .5mfd capacitor to pin 7 (grid) of the 6CX8 (2nd Amp.) Common or low side to chassis. Place the transmitter approximately 3 inches away from the microphone, press the Channel Selector button of the transmitter and rotate the unit for maximum meter or scope indication. Without moving the transmitter, continue pressing the Channel Selector button and adjust A5 for maximum indication. Remove the AC meter or scope and remove the transmitter.

REMOTE CONTROL RECEIVER ALIGNMENT TR-4

Unplug the microphone.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to microphone input. Low side to chassis.	41.0KC (300 microvolts output)		DC probe thru 470K to pin 3 of Service Test Receptacle. Common to chassis.	A1 (Top slug)	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Use zero point farthest from chassis.
2.	"	"	38.5KC		DC probe thru 470K to pin 1 of Service Test Receptacle. Common to chassis.	A2 (Top slug)	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 1 and 2.
3.	"	"	41KC (50 microvolts output)		DC probe thru 470K to pin 4 of Service Test Receptacle. Common to chassis.	A3 (Bottom slug)	Adjust for maximum deflection. Use peak nearest chassis.
4.	"	"	38.5KC (50 microvolts output)		DC probe thru 470K to pin 2 of Service Test Receptacle. Common to chassis.	A4 (Bottom slug)	Adjust for maximum deflection. Use peak nearest chassis. Repeat steps 3 and 4.
5.	"	"	39.75MC (50 microvolts output)		DC probe thru 470K to pin 4 of Service Test Receptacle. Common to chassis.	A5	Adjust for maximum deflection. Use peak farthest from chassis.

NOTE: A6 has not been adjusted at this time. Due to the additional equipment requirements, it is normally adjusted at the factory. Therefore, adjustment of A6 should only be made if the coil has been replaced or tampered with. Remove the signal generator and plug the microphone back into its socket. Connect either a high impedance AC meter (capable of reading .1 volt) or an oscilloscope thru a .5mfd capacitor to pin 7 (grid) of the 6CX8 (2nd Amp.). Common to chassis. Place the transmitter approximately 3 inches away from the microphone. Press the Channel Selector button and rotate the transmitter for maximum meter or scope indication. Without moving the transmitter, continue pressing the Channel Selector button and adjust A6 for maximum indication. Remove the test equipment.



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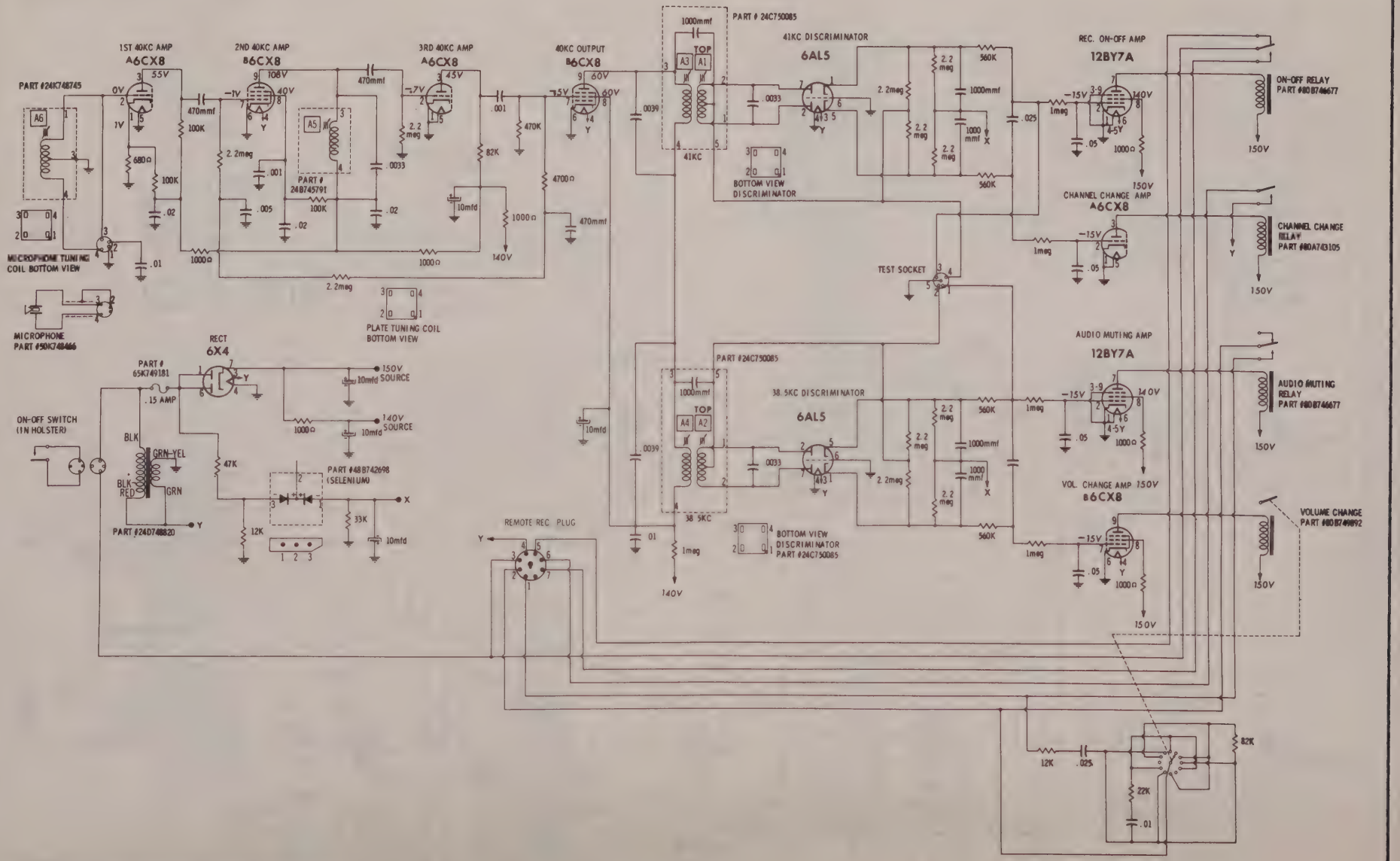
REMOTE CONTROL TR-3

MOTOROLA CHASSIS NTS-544, GTS-544, RTS-544, RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89



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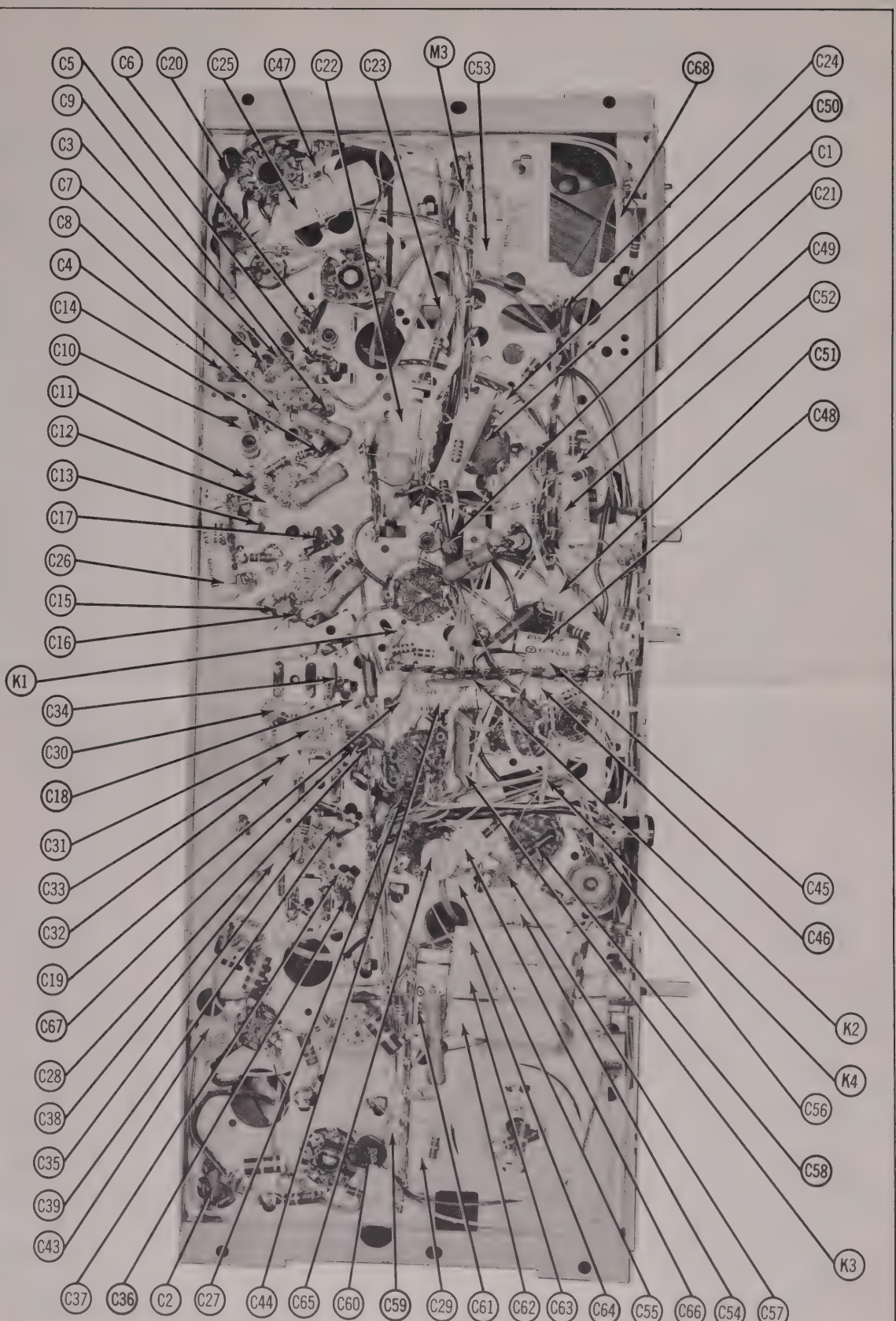
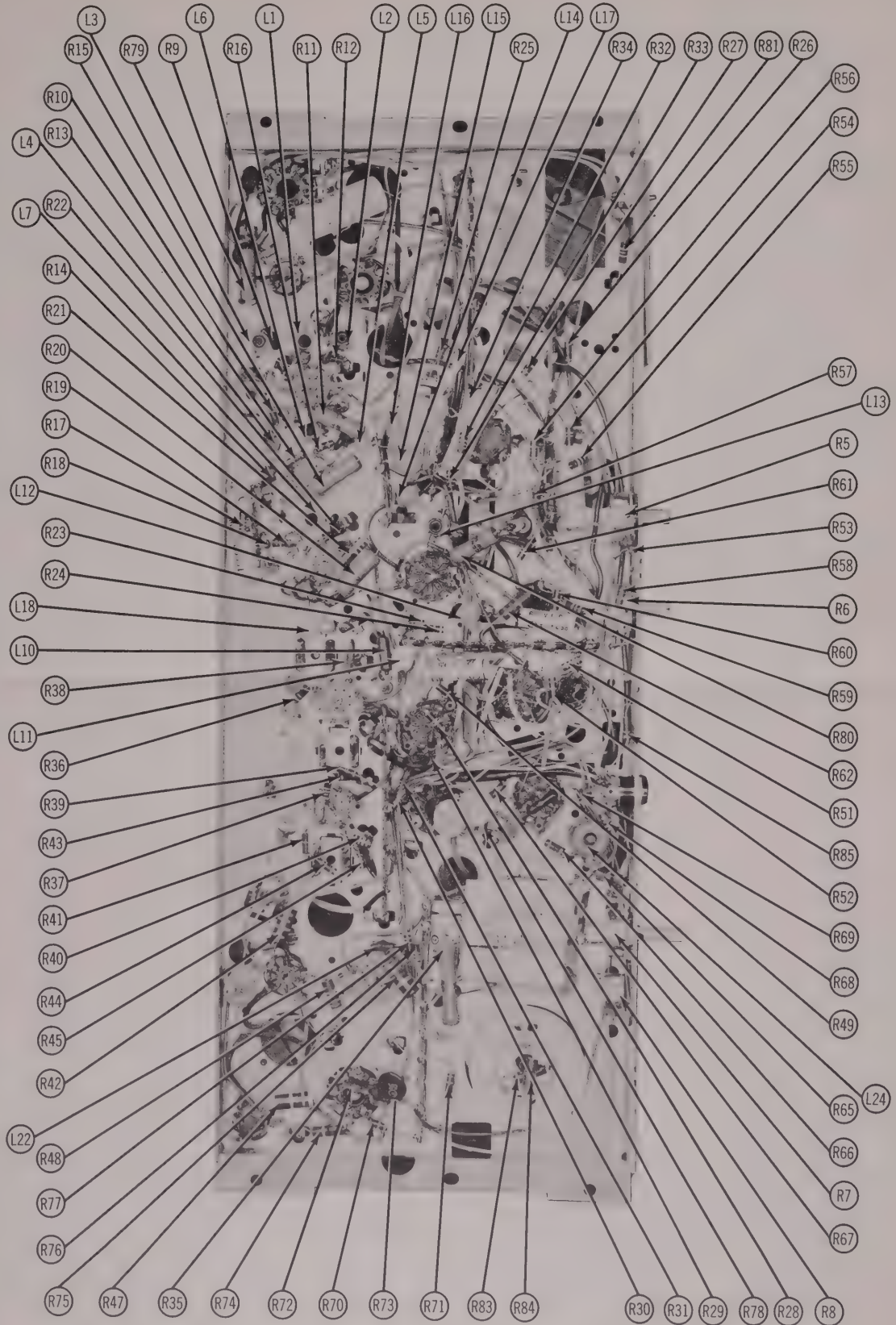
REMOTE CONTROL TR-4



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENTIFICATION

MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544,
RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MOTOROLA CHASSIS NTS-544, QTS-544, RTS-544,
RTS-544Y, STS-544, STS-544Y, TR-3, TR-4, TR-89

FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	3BZ6	
V2	2nd Video IF Amp.	3BZ6	
V3	3rd Video IF Amp.	3BZ6	
V4	Video Output	12BY7A	
V5	AGC Keying-Noise Limiter-Sync Sep.	3BU8	
V6	Sound IF Amp.	3BZ6	
V7	Audio Det.	3DT6	
V8	Audio Output	EL84/6BQ5	
V9	Sync Phase Inv. - Vert. Mult.	6CG7	
V10	Vert. Mult. -Vert. Output	6AQ5A	
V11	Horiz. AFC	6AL5	Note 1
V12	Horiz. Mult.	6CG7	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AF3	
V15	HV Rect.	3A3	3A3/144A01*
V16	LV Rect.	5U4GB	

* Alternate. Note 1. Some versions may use Selenium Rect. (Part #48B742698) in this application.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	MOTOROLA PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V17	21CBP4A	21BTP4	21CBP4-A ②	21CBP4/21CBP4A ③	① "Aluminized". Add Ion Trap. ② "Silverama" ® ③ "Silver Screen"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	350	23K747541	AFH4-05-60	D0044			TVLS-4605-6*	
B	■80	300							
C	▲10	300							
D	10	300							
C2A	▲10	300	23K738750	AFH3-108	C0810	FP330	TMT-93	TVL-3635.5	
B	■30	300							
C	20	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	18		N150 10%	21R120578						
C4	8.2		N150±.5mmf	21R128940						
C5	5.6		N150±.5mmf	21R129124						①
C6	56		N150 10%	21R128699						
C7	470			21R114554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C8	.75			21K735623						②
C9	1000			21K737426	EF-001	MFT-1000			503C-D1	
C10	22		N150 10%	21R120539						
C11	470			21R114554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C12	560			21K746762	DI-560	DD-561	BYA10T56	B-356	5GA-T56	
C13	1000			21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C14	470			21C746761	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C15	470			21C746761	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C16	1000			21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	③
C17	470			21C746761	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C18	3.9		10%	21R115953					5TCCB-V39S10%*	
C19	20000			21K741862	BPD-02	DD-203	BYB6S2	B-120	5GA-S2	
C20	68		N470 10%							④
C21	27		N150 10%	21R119896						
C22	.1	400		8R121006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C23	10000	1400		21R124832	DAC-27	DD16-103	HVE16S1	2HV-110	20HKB-S1	
C24	5000	2000		21R120093		DD30-502	HVC20D5		20HKB-D5	
C25	.25	100		8K122045	P288N-25		CUB2P25	GEM-4025	2TM-P25	
C26	.25	100		8K124570	P288N-25		CUB2P25	GEM-4025	2TM-P25	
C27	470	2000		21R121478	HVD-30-470	DD30-471	HVB20T47	2HV-347	20GA-T47	
C28	2.7		NPO±.25mmf	21R125699					5TCCB-V27S ±.25mmf*	
C29	.1	400		8R121006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C30	1000			21A121678	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C31	.75			21K735623						
C32	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C33	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C34	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C35	18		N150 10%	21R120578						
C36	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	150			21K745777	BPD-00015	DD-151	L10T15	JL-315	5GA-T15	
C38	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C39	5000			21K738298	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C40	2200			21K121882	BPD-0022	DD-222	BYA10D22	B-222	5HK-D22	⑤
C41	220			21R410115	BPD-00022	DD-221	L10T22	B-322	5GA-T22	⑤
C42	1500		10%	21K122498	DI-1500			JL-215	5HK-D15S 10%*	⑤
C43	5000	2000		21R121093		DD30-502	HVC20D5		20HK-D5	
C44	.02	600		8R122079	P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C45	.015	200		8K735821	P288N-015	DD16-153	CUB6S15	GEM-6115	6TM-S15	
C46	.007	200		8K741231	P288N-007	DD16-702	CUB16D7	GEM-627	MB-D7	
C47	10000			21R482726	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C48	.01	600		8R122285	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C49	.05	600		8R122288	P688N-05	DF-503	CUB6S5	GEM-615	6TM-S5	
C50	.05	200		8R121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C51	.02	600		8R122079	P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C52	20000			21B741862	BPD-02	DD-203	BYB6S2	B-120	5GA-S2	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	VOLT	TOL	MOTOROLA PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C53	.05	400		8IR21567	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C54	.05	200		8IR21005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C55	.02	200		8IR21003	P288N-02	DD-303	CUB2S2	GEM-413	2TM-S3	
C56	.0039	400		8IR25942	P488N-004	DE-403	CUB4D4	GEM-434	6TM-D4	
C57	82		N750 10%			TCN-82	C10QS82U	CNT-482		
C58	680		10%	21K736048	1464-00068	MD-681	IR5T68	JL-568	MH-568	
C59	390		10%	21K748364	DI-390	MD-390	L10T39	MCB5243	5GA-T3S9 10% *	
C60	5000			21R815310	BPD-005	DD-503	BYA10D6	B-350	5HK-D6	
C61	.1	400		8IR21006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C62	.1	600		8IR21869	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C63	.1	600		8IR21869	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C64	.05	1000		8IR21870	P1088N-05	DD30-502	CUB10S5	GEM-1015	10TM-S5	
C65	180	3000	10%	21R129124					30GAB-T1S5 10%*	③
C66	180	3000	10%	21R129124					30GAB-T1S5 10% *	③
C67	1000			21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-D5	
C68	10000	600		21R124833	DAC-27	DD-103	6VR16S5	2BV-110	20HKB-S1	
C69	82	3000	10%	21R129150				3DY-482	30GA-Q8S2 10% *	

① Chassis Coded A01, A02 use 10mmf in this application (Part #21R128096).
② Some versions may use 4.7mmf in this application.
③ Not used in some versions.
④ Some versions may use 47mmf in this application (Part #21R115593).
⑤ Some versions may use component combination(4700mmf, 220mmf, 3300mmf and 68K) in this application (Part #61K748483).
Chassis QTS-544 uses component combination (220mmf, 3300mmf and 68K) (Part #61K748483).
⑥ Chassis Coded A00 use 150mmf in this application (Part #21R125423).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250Ω	½	18K748008					Contrast, ↓
B	2meg	½					● UE3985-S	Volume, Tap ② 1.5meg, ↓
C	Switch							On-Off
R2A	1meg	½	18K749387	B-70	A47-1meg-Z	Q3S-197	U5S	Tone, ③
B	Shaft			Not Req.	KS8-2	Not Req.	Not Req.	
R3A	250K	½	18K748870		B47-250K-S†	BU-130 †	TA25AL †	Brightness, Stop ② 125K, ③
B	Shaft				Not Req.	TM3	Not Req.	
R4A	2meg	½	18K748948		B47-2meg-S	BU-139	TA36L	Vert. Hold, ④
B	Shaft				Not Req.	TM3	Not Req.	
R5A	4meg	½	18K743584	AB-96	A47-4meg-S	QU-141	PTA56L	Vert. Size
B	Shaft			AK-19	RM-3	TQ	Not Req.	
R6A	2meg	½	18K743523	AB-75	B47-2meg-S	QU-139	PTA26L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7A	70K	½	18K748335	AB-35	A47-75K-S	QU-125	PTA18L	Horiz. Hold
B	Shaft			AK-19	RM-13	TQ	Not Req.	
R8A	5000Ω	2(WW)	17B746869		A43-5000		FL5K	Horiz. Size
B	Shaft				AK-19		Not Req.	

Note 1. Chassis NTS & QTS-544 use Part #18K748944.
Note 2. Not used in chassis QTS-544. Some versions may use Part #18K736148.
Note 3. Chassis NTS & STS-544 use Part #18K748234.
Note 4. Chassis NTS & STS-544 use Part #18K736556.
† Use 125 K resistor in series with left hand terminal.
● "STA-LOC" Equivalent: FA26IL, O8S00, 26T1254.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	MOTOROLA PART No.	NOTES
R9	2200Ω		6R6069	
R10	1000Ω		6K127980	
R11	2200Ω	3	17K738283	
R12	47Ω		6K127542	
R13	8200Ω		6K119931	
R14	1000Ω		6K127980	
R15	8200Ω	3	17K738283	
R16	47Ω		6K127542	
R17	680K		6K128229	
R18	1000Ω		6K127980	
R19	15K		6K119934	
R20	8200Ω	3	17K738283	
R21	47K	1	6K131299	Note 1
R22	120Ω		[illegible]	
R23	47K		6K131299	
R24	3900Ω		6K121931	
R25	220K		6K132322	
R26	1000Ω		6R6054	
R27	100K		6K122313	
R28	820K		6K128320	
R29	2.5meg		6K127001	
R30	15meg 5%		6K125891	
R31	1.5meg 5%		6K127000	
R32	33K		6K127632	
R33	18K		6K122948	
R34	5600Ω	10	17K747879	
R35	47K	4	17K743157	
R36	4700Ω		6K121847	
R37	47K		6K131299	
R38	2200Ω		6K127099	
R39	1000Ω		6K127980	
R40	390K		6R6546	
R41	2200		6K125471	
R42	22K	2	6R6069	
R43	560Ω		6R400058	
R44	82K		6K125179	
R45	560K		6K128228	
R46	120K		6K127540	Note 2
R47	470Ω	2	6K125146	

ITEM No.	RATING OHMS	WATT	MOTOROLA PART No.	NOTES
R48	180Ω	1	6R6390	
R49	2.2meg		6K127001	
R50	1meg		6K124494	
R51	18K		6K122648	
R52	5.6meg		6K124761	
R53	1meg		6K123324	
R54	15K		6K119934	
R55	180K		6K125531	
R56	6200Ω		6K119931	
R57	18K		6K122648	
R58	220K		6R6015	
R59	470K		6K119406	
R60	22K		6K119935	
R61	22K		6K119935	
R62	160Ω	2	6K119403	
R63	560Ω		6K122602	
R64	560Ω		6K122603	
R65	12Ω	1	6K127508	
R66	8200Ω		6K119931	
R67	1000Ω		6K119932	
R68	39K		6K121931	
R69	56K		6K123228	
R70	3900Ω		6K121931	
R71	6800Ω		6K119930	
R72	1meg		6K124494	
R73	470Ω		6K127533	
R74	12Ω	1	6K127508	Note 1
R75	8200Ω	2	6K120579	
R76	330K		6K128227	
R77	33K		6K121704	
R78	6800Ω	1	6K124699	
R79	8200Ω	3	17K738283	Note
R80	10K	3	17K744464	
R81	470K		6K119406	Note
R82	82Ω	1	6R488113	
R83	8.2Ω	1	6K128098	
R84	27K	1	6K121901	Note 1
R85	4.7meg			

Note 1. Not used in some versions.
Note 2. Some versions may use component combination (4700mmf, 220mmf, 3300mmf and 68K) (Part #61K748483). Chassis QTS-544 uses component combination (220mmf, 3300mmf, and 68K) (Part #61K748482).
Note 3. Chassis Coded A00, A01 use 10K 3W in this application (Part #17K744464).
Note 4. Not used in chassis Coded A.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA	
K1	Video Coupling	4700mmf, 68K	Note 1	Sprague	PRC-6
K2	Sync Input	27mmf, 220mmf, 2000mmf, 56K, 96K, 470K, 560K, 3.3meg	51B747693	Sprague	HN-5
K3	Sync Output	2000mmf, 3300mmf, 4700mmf, 2200Ω, 2200Ω, 27K, 180K	51B747279	Sprague	VF-3
K4	Horiz. AFC	1000mmf, 1000mmf, 3300mmf, 100K, 100K, 4.7meg	51B747561	Sprague	F-4

Note 1. Not used in chassis coded A or B00. Some versions may use individual components.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	24C747584	20-1049	TV-153 *			
L2	39.75MC Trap	24K747583	20-1044 ▲	TV-152			
L3A	1st Video IF	24K747586					
B	41.25MC Trap						
L4	47.25MC Trap	24K747585	20-1049	TV-153 *			
L5	Fil. Choke	24K743675	19-1061	RC-562	4804		
L6	2nd Video IF	24K747587	17-4522	TV-130	6319	VF-3	
L7	3rd Video IF	24K747587	17-4522	TV-130	6319	VF-3	
L8	Peaking Coil	24K747589					Includes M4
L9	Resonant Choke	24K733225					10 Microhenries
L10	Resonant Choke	24K733235					10 Microhenries
L11	Series Peaking Coil	24K744411	19-3100 *	TV-181 *	6112 *	VP-3 *	100 Microhenries, wound on 5600Ω resistor
L12	Shunt Peaking Coil	24D736006	19-3180	TV-184	6180	VP-5	180 Microhenries
L13	4.5MC Trap	24K739200	20-1004	TV-151	1469 *	SF-3	
L14	Series Peaking Coil	24K746871	19-3300 *	TV-200 *	6132 *	VP-7 *	330 Microhenries, wound on 5600Ω resistor
L15	Shunt Peaking Coil	24K744410	19-4400	TV-202	6136		400 Microhenries
L16	Shunt Peaking Coil	24K743240					1400 Microhenries, wound on 2700Ω resistor
L17	Resonant Choke	24R119889					8.5 Microhenries
L18	Resonant Choke	24K743727					7.5 Microhenries ↑
L19	1st Sound IF	24B743463					Tapped ② 1.4Ω
L20	2nd Sound IF	24D738943	17-3405 ■	TV-113 ■	6203 ■	SF-2 ■	
L21	Quadrature Coil	24K748031					
L22	RF Choke	24B747171			4611		7.5 Microhenries
L23	RF Choke	24B747171			4611		7.5 Microhenries

* Disregard Tap. ▲ Use original cap. C6. + Parallel with 5600Ω resistor.
① IRC Part #CLA. ■ Disconnect C95 (18mmf).

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	SEC.	MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L24	40Ω		24K743428	19-1576 *	TV-165 ■	6210 *	H-102 *	28-5 *	Horiz. Freq. * Enlarge mounting hole. ■ Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ~(♪)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	.270A	27Ω	1 Hy.	25K746803	CS04I	C-2995	F-801	C-2328	28C92	C-23X

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	580CT	5V	25D745778						
	@1.8A	@.270A	@ 3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3V									
	@9.5A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	25K744974	Z1803 ↓	A-2853 ②	V309 ↓	V028 ↓	VO-100 ②	28S31 ↓	A-102X
T3	Yoke (Horiz. 24MH)	24D743765	DF-810	MDF-97		MY-3		Y-15	Y-45-2
	(90°) (Vert. 39MH)		③④⑤⑦	③④⑤		③④⑤		③④⑤	④
	Alternate Yoke	24K744323							
	Rear Cover & Centering Device	59C721145							YC-1
	Yoke Clamp	42A736175							CL-1
	Yoke Retainer	42A736257							
T4	Horiz. Output	24K748397		MOC-2					
	Primary Coil	24K748396							
	Secondary Coil	24K745108							

① Connect as autoformer.
② Tape blanking lead.
③ Use original pincushion magnet assembly.
④ Connect same as original.
⑤ Remove jumper between vertical and horizontal windings.
⑦ Use original damping network, if necessary.
⑦ Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4800Ω	8-8Ω	25K749230 ①	Z1002	A-2901	AU-804	A-2203	24S84	S-53X	
	5000Ω	3-4Ω	25K743211 ②	Z1002	A-3019	AU-800	A-3337	26S49	S-5Z	

① Used in Chassis Coded B and higher ② Used in Chassis Coded A

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	8"	PM	6-8Ω	50K743276 ①	RA12Z8 ? ①	① Connect in parallel and phase
SP2	4"	PM	14-16Ω	50K744708 ②	4A15Z15.2 ②	② Replacement Part #50K744704.
	6"	PM	8Ω	50K749189		③ Replacement Part #50K740279.
	8"	PM	3-4Ω	50K748629 ③		④ Replacement Part #50K744707.
	8"	PM	8Ω	50K749188		⑤ Replacement Part #50D739234.
	6" x 9"	PM	3-4Ω	50K748734 ④		⑥ Replacement Part #50B634504.
	6" x 9"	PM	3-4Ω	50K749104 ⑤		⑦ Replacement Part #50C638897.
	6" x 9"	PM	8Ω	50K749196		
	6" x 9"	PM	16Ω	50K749195		
	6"	PM	3-4Ω	50K748866		
	5 1/4"	PM	3-4Ω	50K749865 ⑥		
	4"	PM	6-8Ω	50K744708 ⑦		
	4"	PM	3-4Ω	50K748864		
	4"	PM	3-4Ω	50K748863 ⑦		
	4"	PM	3-4Ω	50K749410		
	4"	PM	8Ω	50K749193		
	4"	PM	16Ω	50K749190		

FUSES

ITEM No.	TYPE	RATING	MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTLEFUSE PART No. FUSE	LITTLEFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5A 250V	65A742612 ①	31A737466	312005 (3AG-5A-250V)	357001	MTH5	4406
M2	N	3/10A 125V (N-3/10A-125V-S/B)	65B743104	9K743152	333.300 (N-3/10A-125V-S/B)	346008	N 3/10	HN 0 to 3/10
M3	2" Length of #26 Wire							

① Manufacturers' replacement Part #65R52293.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	MOTOROLA PART No.	GE PART No.	SYLVANIA PART No.	NOTES
M4	841	48K747548	1N80	1N80	Video Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Lamp	65K749184	#81X, Ch. QTS-544, Y, RTS-544, Y
	Lamp	65A746748	#44, Ch. NTS-544, STS-544
M6	Tuner	1U748447	VHF, TT-108
	Tuner	1U748261	VHF, TT-105, Ch. STS-544
	Tuner	1U748478	VHF, TT-106, Ch. QTS-544
	Tuner	1U749247	VHF, TT-116, Ch. NTS-544
	Tuner	1U748277	VHF, with UHF provisions, TT-105Y, Ch. STS-544Y
	Tuner	1U748448	VHF, with UHF provisions, TT-106Y, Ch. RTS-544Y
	Tuner	68P742562	UHF, TT-88, Ch. RTS-544Y
M7	Thermal Switch	5C746780	130G, Cold
M8	Magnet	48B737365	Anti-Pin Cushion

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	61C743986	Models Y2I & 21K95 Series, A2IK95M
Safety Glass	61C747252	All models except Y2I & 21K95 Series, A2IK95M
Mask	13K743958	Models Y2I & 21K95 Series, A2IK95M
Mask	13K748039	Models Y2I & 21K95 Series, 21K000 Series
Mask	13K748041	Models Y2I & 21K101 Series, 21K102 Series, Y2I & 21K103 Series
Mask	13K748034	Models Y2I & 21T98 Series, 21T60 Series, Y2I & 21T61 Series
Mask	13A748182	Channel Indicator
Window	61A748181	Channel Indicator
Dial	1A748205	Channel Indicator
Knob	36K748177	VHF Channel Selector, Models 21K95 Series, A2IK95M
Knob	1V748504	VHF Channel Selector All models except Y2I & 21K95 Series, A2IK95M
Knob	36K748178	VHF Channel Selector, Models Y2IK95 Series
Pushbutton	36C747248	VHF Channel Selector
Knob	36K745987	Fine Tuning, Models Y2I & 21K95 Series, A2IT95M
Knob	1V748512	Fine Tuning, All VHF models except Y2I & 21K95 Series, A2IT95M
Knob	1V748517	Fine Tuning, All UHF-VHF models except Y2IK95B, M
UHF Dial	34K744741	Models Y2IK95B, M
UHF Dial	34C748136	All UHF-VHF except Y2IK95B, M
Knob	36K748202	Volume-On-Off, Models Y2I & 21K95 Series, A2IK95M
Knob	1V748505	Volume-On-Off, Models Y2I & 21K98 Series, Y2I & 21K103 Series, 21K106 Series, Y2I & 21T58 Series, 21T60 Series, Y2I & 21T61 Series
Knob	36K748203	Brightness, Vert. Hold, Tone, Models Y2I & 21K95 Series, A2IK95M
Knob	36D743431	Brightness & Vert. Hold, All models except Y2I & 21K95 Series, A2IK95M
Knob	36D748044	Tone, All models except Y2I & 21K95 Series, A2IK95M
Knob	36D748184	Contrast, Models Y2I & 21K95 Series, A2IK95M
Knob	36C748137	Contrast, All models except Y2I & 21K95 Series, A2IK95M
Knob	36K748069	Horiz. Hold

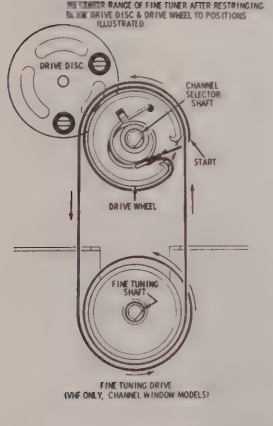
PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

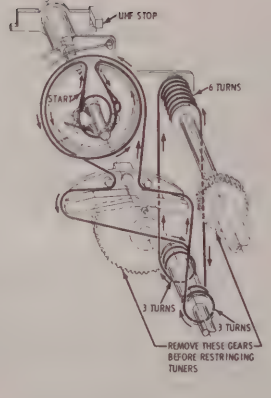
NAME	PART NO.	DESCRIPTION
Cabinet	16K747375	Blond Oak, Includes Base, Models 21K95B, Y21K95B
Cabinet	16E749231	Mahogany, Includes Base, Models A21K95M
Cabinet	16E747374	Mahogany, Includes Base, Models 21K95M, Y21K95M
Cabinet	16K748125	Blond Oak, Models Y21 & 21K98B, BA
Cabinet	16E748125	Mahogany, Models Y21 & 21K98M, MA
Cabinet	16K748133	Walnut, Models Y21 & 21K98W, WA
Cabinet	16K748291	Blond Oak, Models 21K101B, BA
Cabinet	16E748290	Mahogany, Models 21K100M, MA
Cabinet	16K748344	Blond Oak, Models Y21 & 21K101B, BA
Cabinet	16E748342	Mahogany, Models Y21 & 21K101M, MA
Cabinet	16K748343	Walnut, Models Y21 & 21K101W, WA
Cabinet	16E748352	Cherry, Models 21K102CU, CUA
Cabinet	16K748045	Blond Oak, Models Y21 & 21K103B, BA
Cabinet	16E749174	Cherry, Models Y21 & 21K103CW, CWA
Cabinet	16E748044	Mahogany, Models Y21 & 21K103M, MA
Cabinet	16K748046	Calif. Mahogany, Models Y21 & 21K103MC, MCA
Cabinet	16K747662	Blond Oak, Model 21K106B
Cabinet	16D747660	Mahogany, Model 21K106M
Cabinet	16K748362	Limed Oak, Models Y21 & 21T58BG, BGA
Cabinet	16K748363	Charcoal, Models Y21 & 21T58CH, CHA
Cabinet	16K748360	Mahogany, Models Y21 & 21T58MG, MGA
Cabinet	16K748357	Blond Oak, Model 21T60BG
Cabinet	16K748358	Charcoal, Model 21T60CH
Cabinet	16K748355	Mahogany, Model 21T60MG
Cabinet	16K748123	Blond Oak, Models Y21 & 21T61B, BA
Cabinet	16E748122	Mahogany, Models Y21 & 21T61M, MA
Legs	16K748189	Blond Oak, Includes Ferrule & Bolt, Models Y21 & 21K95B
Legs	16K748188	Mahogany, Includes Ferrule & Bolt, Models Y21 & 21K95M
Legs	16K748130	Models Y21 & 21K98B, BA
Legs	16K748131	Models Y21 & 21K98M, MA
Legs	16K748127	Models Y21 & 21K98W, WA
Legs	16K745198	Models Y21 & 21K103B, BA
Legs	16K749177	Models Y21 & 21K103CW, CWA
Legs	16K748617	Models Y21 & 21K103M, MA
Legs	16K746841	Models Y21 & 21K103MC, MCA
Legs	16K747668	Model 21K106B
Legs	16K747666	Model 21K106M
Swivel Base	16K747298	Models Y21K95 Series, A21K95M, Y21 & 21K101 Series
Swivel Base	1K748347	Assembly, Models Y21 & 21K101B, BA
Swivel Base	1K748345	Assembly, Models Y21 & 21K101M, MA
Swivel Base	1K748346	Assembly, Models Y21 & 21K101W, WA
Sub Base	16K748187	Assembly, Includes Swivel less legs, Models Y21 & 21K95B
Sub Base	16K748186	Assembly, Includes Swivel less legs, Models Y21 & 21K95M

WIRING DATA

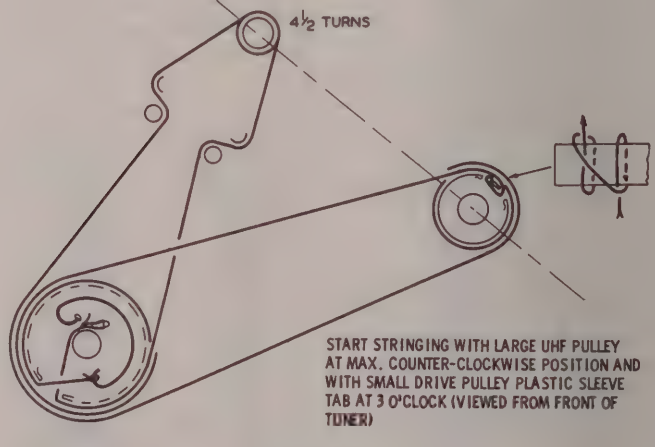
High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



FINE TUNING (VHF MODELS)

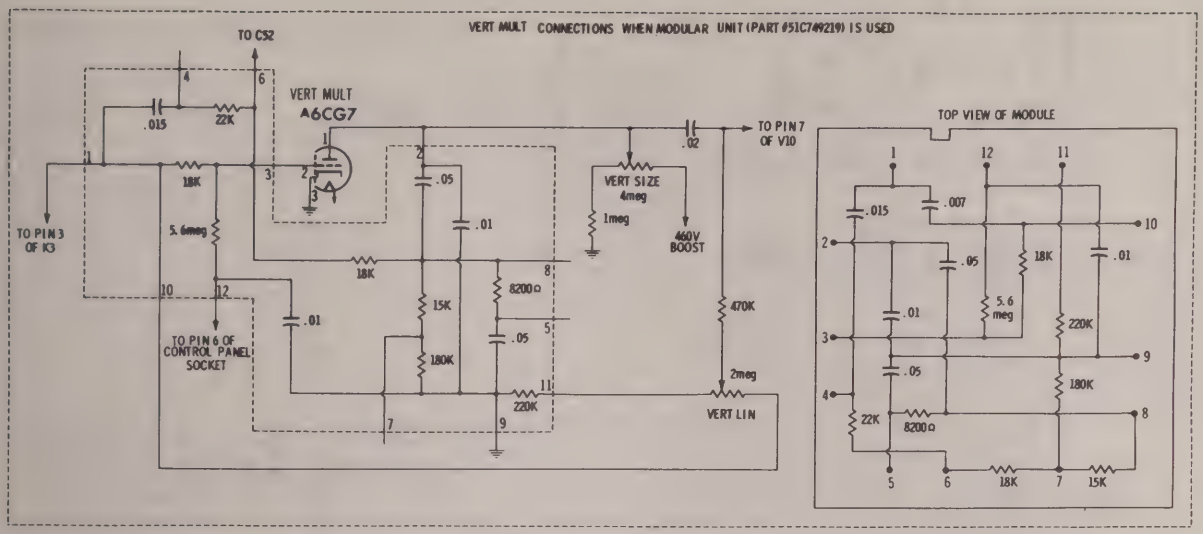


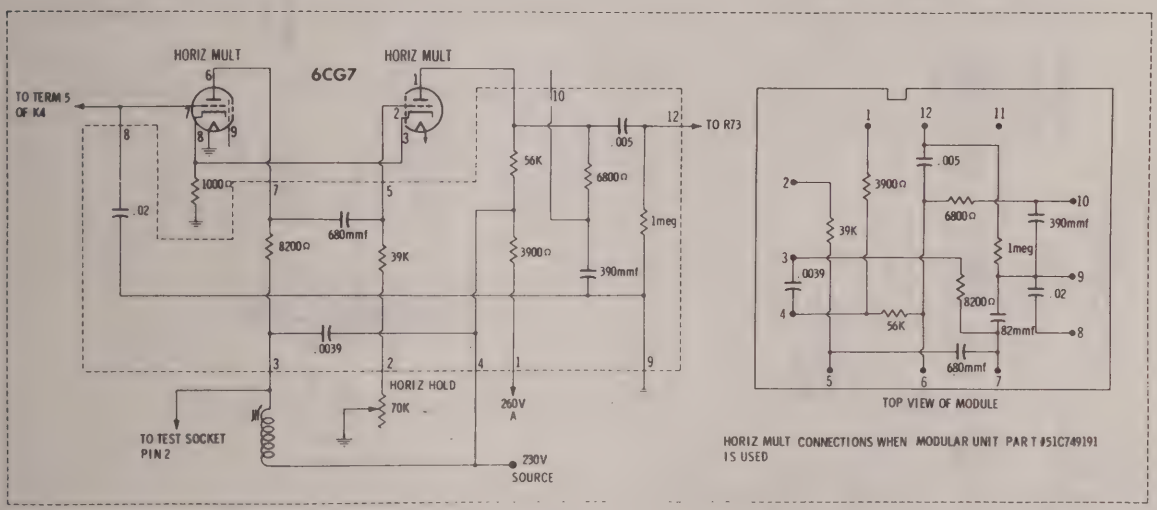
FINE TUNING (UHF-VHF MODELS)

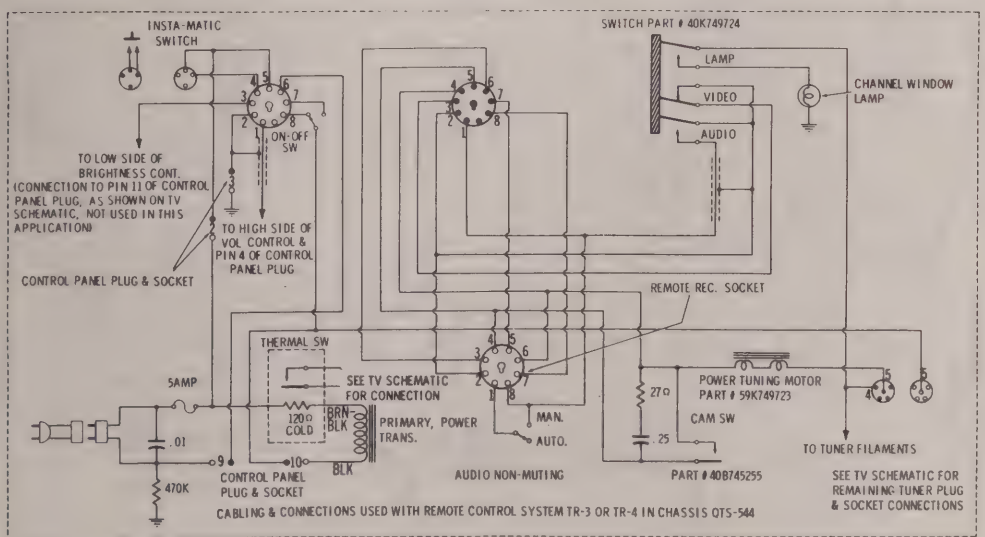

4½ TURNS
START STRINGING WITH LARGE UHF PULLEY AT MAX. COUNTER-CLOCKWISE POSITION AND WITH SMALL DRIVE PULLEY PLASTIC SLEEVE TAB AT 3 O'CLOCK (VIEWED FROM FRONT OF TUNER)

UHF TUNING

DRIVE CORD STRINGING







A PHOTOFACT STANDARD NOTATION SCHEMATIC

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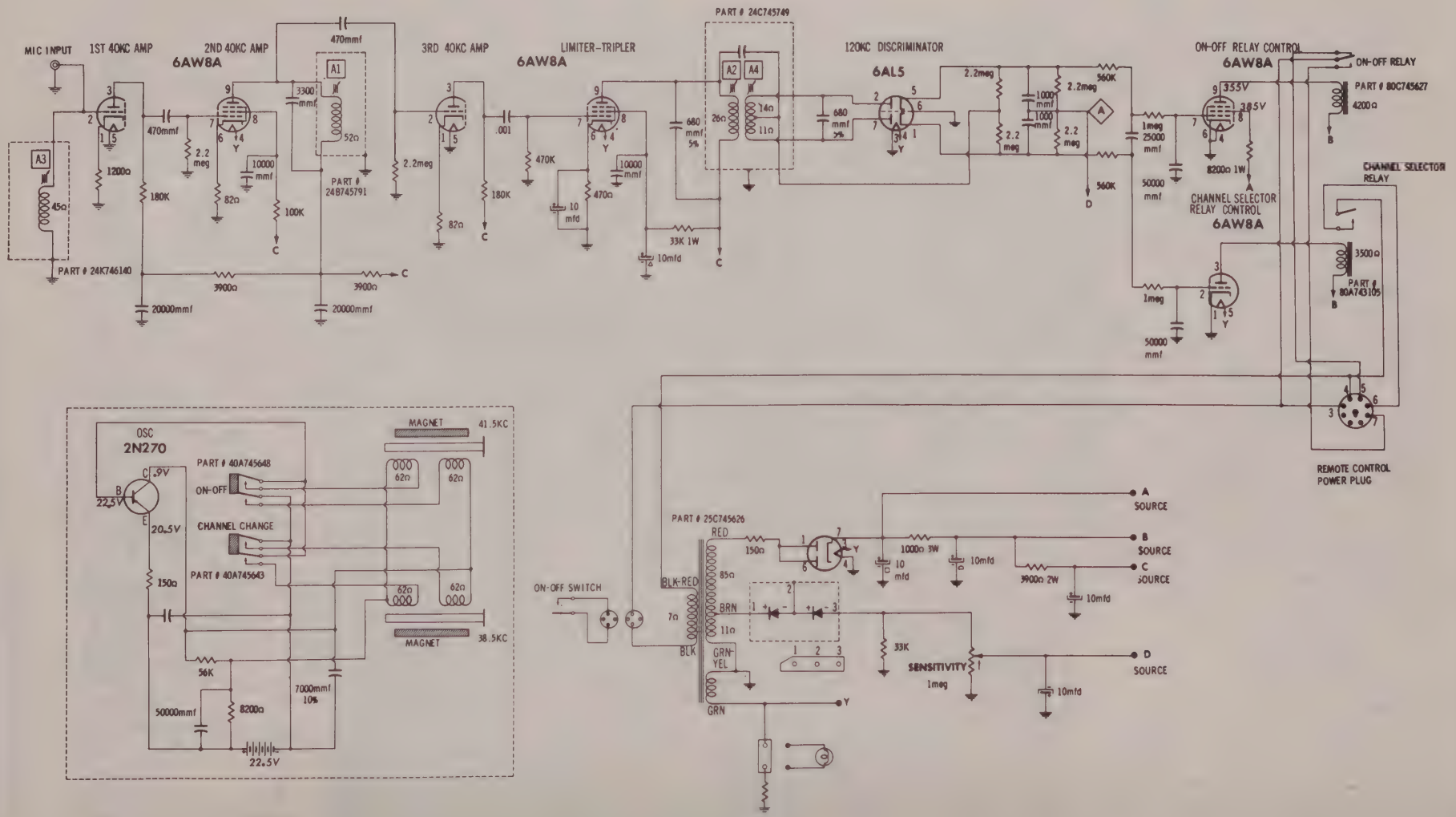
ALTERNATE SCHEMATIC



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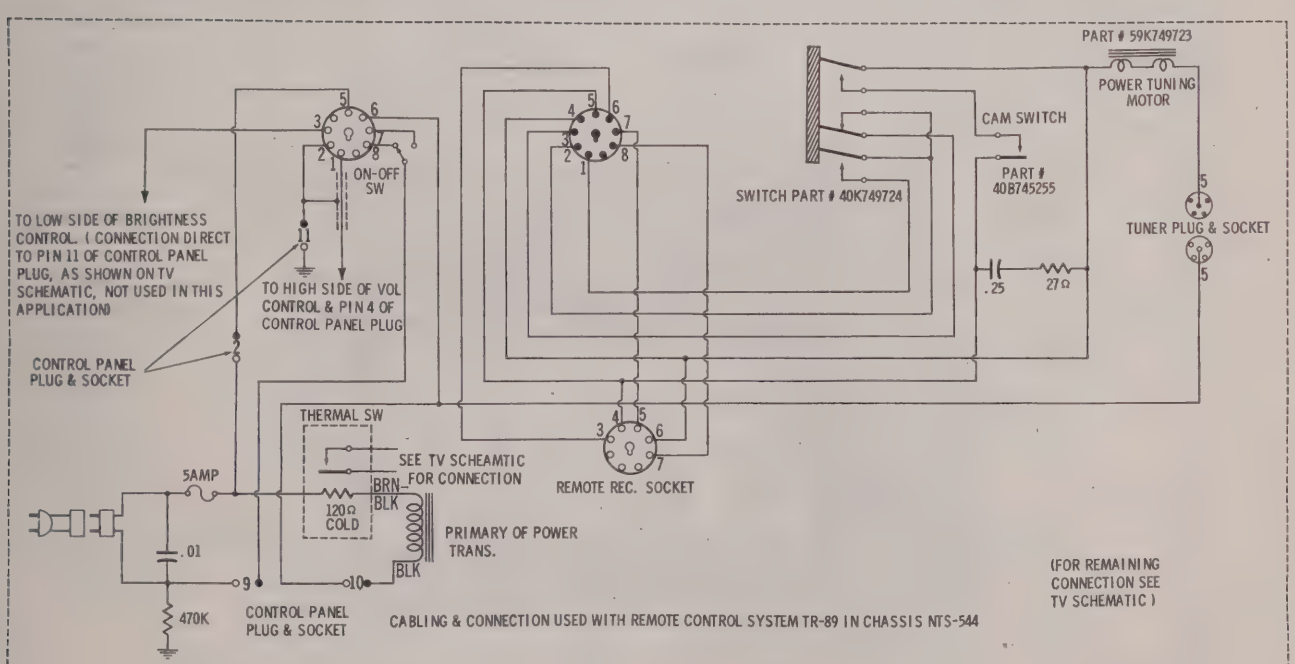
REMOTE CONTROL TR-89RA-03, TR-89TA-01

REMOTE CONTROL
ALIGNMENT INSTRUCTIONS

REMOTE CONTROL RECEIVER ALIGNMENT TR-89

Unplug the microphone.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to microphone input. Low side to chassis.	40KC		DC probe to pin 7 (grid) of 6AW8 (On-Off Relay Control tube) Common to chassis.	Sensitivity Control	Adjust for maximum negative voltage.
2.	"	"	"		DC probe to point (A). Common to chassis.	A1	Set VTVM to -150 volt scale. Increase generator output until meter reads approximately -75 volts. Leave at this setting and adjust A1 for maximum deflection.
3.	"	"	"		"	A2 (Bottom slug)	Turn slug as far out of coil as possible, then start tuning. As slug is turned into coil, the 4th harmonic will be passed. Continue turning into coil until next peak is obtained. This will be 3rd harmonic of 40KC and will be a larger voltage than the 4th harmonic.
	NOTE: A3 has not been adjusted. Due to additional equipment requirements it is normally adjusted only at the factory. Therefore, adjustments of A3 should only be made if the coil has been replaced or tampered with. Remove the signal generator and plug the microphone back in its socket. Connect either a high impedance AC meter (capable of reading .1 volt) or an oscilloscope thru a .5mfd capacitor to pin 2 (grid) of 6AW8A (1st 40KC Amp.). Low side to chassis. Place the transmitter approximately 3 inches away from the microphone, press the channel selector button of the transmitter and rotate the unit for maximum meter for scope indication. Without moving the transmitter, adjust A3 for maximum indication. Remove the AC meter or scope and remove the transmitter. Remove the microphone.						
4.	Direct	High side to microphone input. Low side to chassis.	40KC		DC probe to point (A). Common to chassis.		Increase generator output until no further increase in voltage is noted on VTVM.
5.	"	"	"		DC probe to pin 5 (cathode) of 6AL5. Common to chassis.	A4 (Top slug)	Adjust for zero reading on VTVM.
6.	"	"	"		DC probe to pin 7 (grid) of 6AW8A. (On-Off Relay Control tube). Common to chassis.	Sensitivity Control	Adjust for -25 volts on VTVM.


PART # 59K749723
POWER TUNING MOTOR
CAM SWITCH
PART # 40B745255
SWITCH PART # 40K749724
TUNER PLUG & SOCKET
.25
27Ω
ON-OFF SW
TO LOW SIDE OF BRIGHTNESS CONTROL. (CONNECTION DIRECT TO PIN 11 OF CONTROL PANEL PLUG, AS SHOWN ON TV SCHEMATIC, NOT USED IN THIS APPLICATION)
TO HIGH SIDE OF VOL CONTROL & PIN 4 OF CONTROL PANEL PLUG
CONTROL PANEL PLUG & SOCKET
THERMAL SW
SEE TV SCHEAMTIC FOR CONNECTION
REMOTE REC. SOCKET
5AMP
BRN
BLK
120Ω COLD
PRIMARY OF POWER TRANS.
.01
BLK
470K
CONTROL PANEL PLUG & SOCKET
(FOR REMAINING CONNECTION SEE TV SCHEMATIC)
CABLING & CONNECTION USED WITH REMOTE CONTROL SYSTEM TR-89 IN CHASSIS NTS-544

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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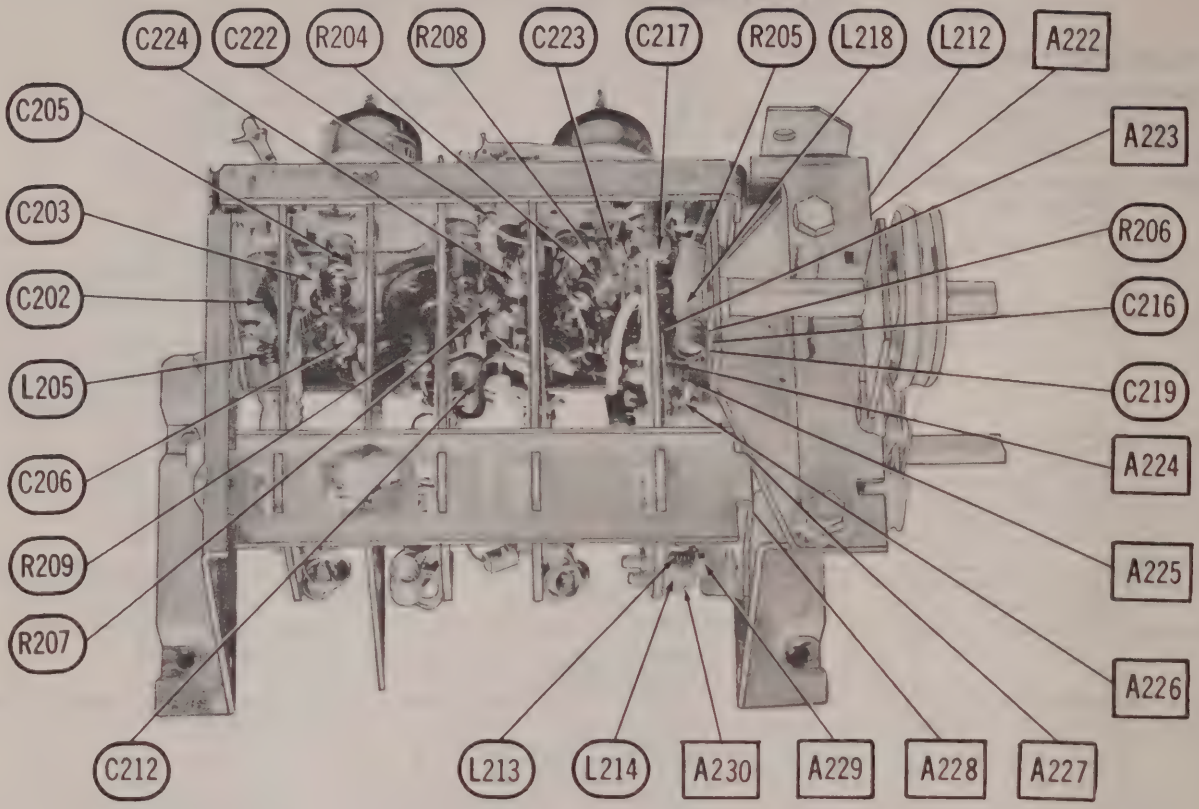
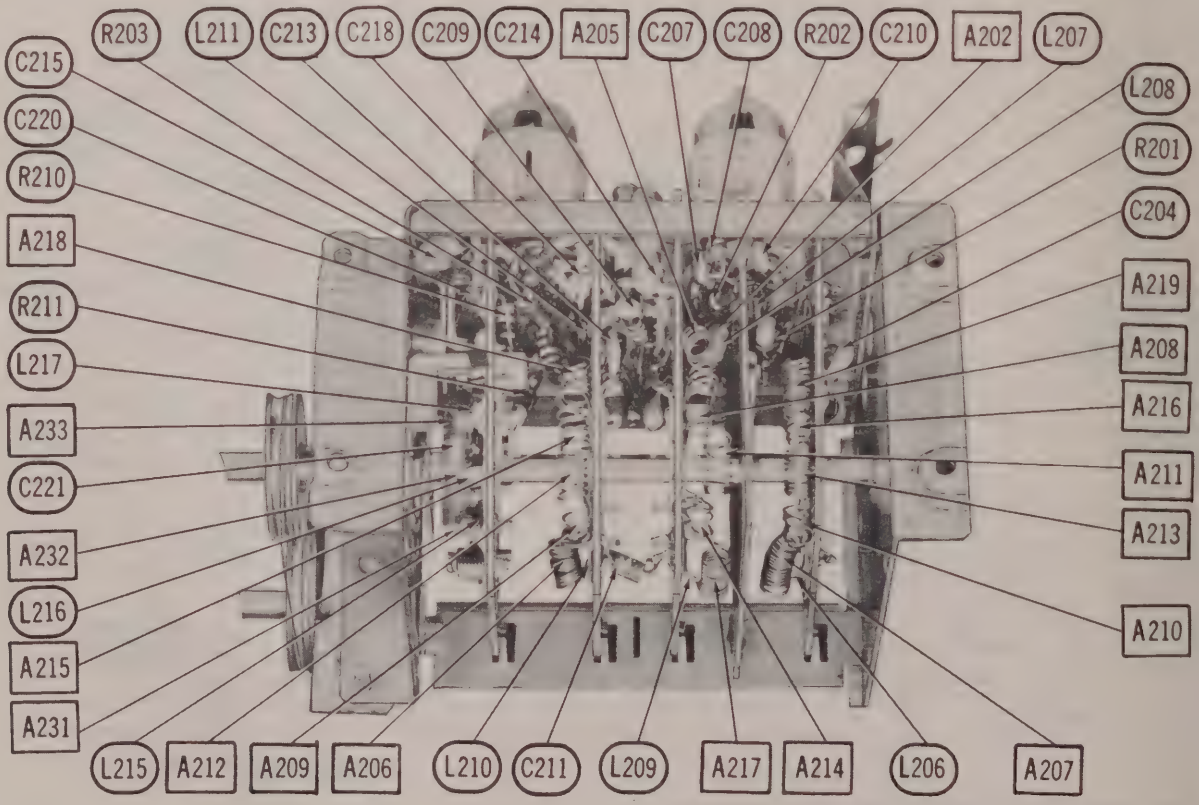
ALTERNATE SCHEMATIC



TUNER 1U748447 - LEFT SIDE



TUNER 1U748447 - RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

The tuner shield must be in place when adjusting the oscillator.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A222	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A223	
			201MC	199.25MC 203.75MC	11		A224	
			195MC	193.25MC 197.75MC	10		A225	
			189MC	187.25MC 191.75MC	9		A226	
			183MC	181.25MC 185.75MC	8		A227	
			177MC	175.25MC 179.75MC	7		A228	
			85MC	83.25MC 87.75MC	6		A229	
			79MC	77.25MC 81.75MC	5		A230	
			69MC	67.25MC 71.75MC	4		A231	
			63MC	61.25MC 65.75MC	3		A232	
			57MC	55.25MC 59.75MC	2		A233	

UHF IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	50Ω Carbon Resistor	High side to point Ⓥ. Low side to chassis.	44MC (10MC Swp)	41.25MC 45.75MC	Any UHF channel	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A234, A235	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.
13.	Disconnect sweep generator and short antenna terminals.				"	USE VTVM Across Video Det. load.	A236	Adjust for maximum DC noise voltage.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

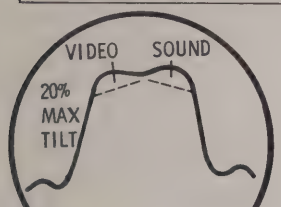


FIG. 201

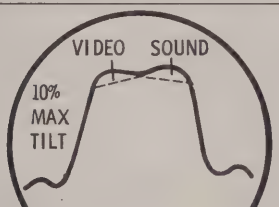


FIG. 202

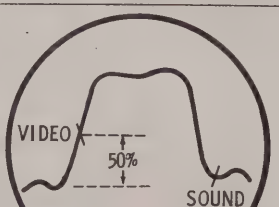


FIG. 203

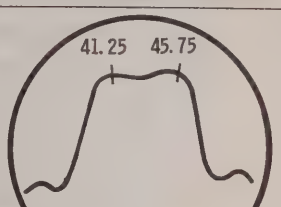
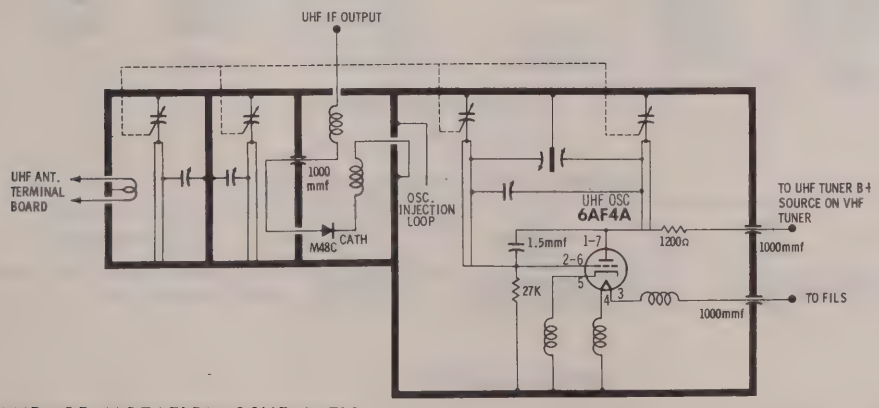


FIG. 204



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF TUNER TT-89

TUNER PARTS LIST AND DESCRIPTIONS

1U748447 (TT-108)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BK7B	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6U8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	27		21R122050			C10Q27U	CN7-427	5TCU-Q27S 5% *	N750 5%
C202	15		21R124919	N750-DI 15	DTN-15	C10Q15U	CN7-415	5TCU-Q15S 10% *	N750 10%
C203	5.6		21R121154					5TCU-Q5.6S ±.5mmf *	N750 ±.5mmf
C204	1000		21R115385	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C205	1000		21K739920	EF-001	MFT-1000			503C-DI	
C206	2.7		21R115950					5TCCB-V27S 10%*	
C207	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C208	1.5		21R115959	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15S 10%*	10%
C209	.5-3		21K735985		829-3				
C210	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C211	1.5		21R115959	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15S 10%*	10%
C212	100		21R120577	DI-100	D6-101	CTA6T1U	CNO-310	5TCC-T1	10%
C213	22		21R124554	NPO-DI 22	DTZ-22	C10Q22C	CNO-422	5TCC-Q22S 5% *	5%
C214	.5-3		21K735985		829-3				
C215	1.0		21R114071						N1500 ±.5mmf
C216	470		21R114554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C217	470		21R114554	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C218	1000		21R115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	
C219	15		21R125056		DTZ-15		CNO-415	5TCC-Q15S 5% *	NPO 5%
C220	15		21R125077		DTZ-15		CNO-415	5TCC-Q15S 5% *	NPO 5%
C221	1.0		21R124552						NPO 2.5%
C222	1000		21K739920	EF-001	MFT-1000			503C-DI	
C223	1000		21K739920	EF-001	MFT-1000			503C-DI	
C224	1000		21K115386	BPD-001	DD-102	BYA10D1M	B-210	5HK-DI	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R201	22K		6K119405	
R202	100K		6K122313	
R203	4700Ω		6K121847	
R204	39K		6K125535	
R205	15K		6K119934	
R206	15K		6K119934	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R207	270K		6R641q	
R208	15K		6K119934	
R209	470Ω		6K127633	
R210	3300Ω		6K121725	Note 1
R211	1000Ω		6K127960	Note 2

Note 1. Not used in some versions.
Note 2. Some versions may use 3300Ω in this application.

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	IF Trap	24B747530 †	
L202	IF Trap	24B747530 †	
L203	Ant. Trans.	24B747543 †	
L204	FM Trap	24B747801 †	
L205	Ant. Coil	24A744031	Channel 13
L206	Ant. Coils	24K748713	Channel 2 - 6
L207	RF Choke	24A739397	
L208	RF Coil	24A739361	Channel 13
L209	RF Coils	24K740811	Channel 2 - 6
L210	Mixer Grid Coils	24K740041	Channel 2 - 6

ITEM No.	USE	MOTOROLA PART No.	NOTES
L211	Mixer Grid Coil	24A741232	Channel 13
L212	Osc. Coil	24K746879	Channel 13
L213	Osc. Coil	24K739385	Channel 6
L214	Osc. Coil	24K739384	Channel 5
L215	Osc. Coil	24K739381	Channel 4
L216	Osc. Coil	24K739382	Channel 3
L217	Osc. Coil	24K739381	Channel 2
L218	Mixer Plate Coil	24B747599	

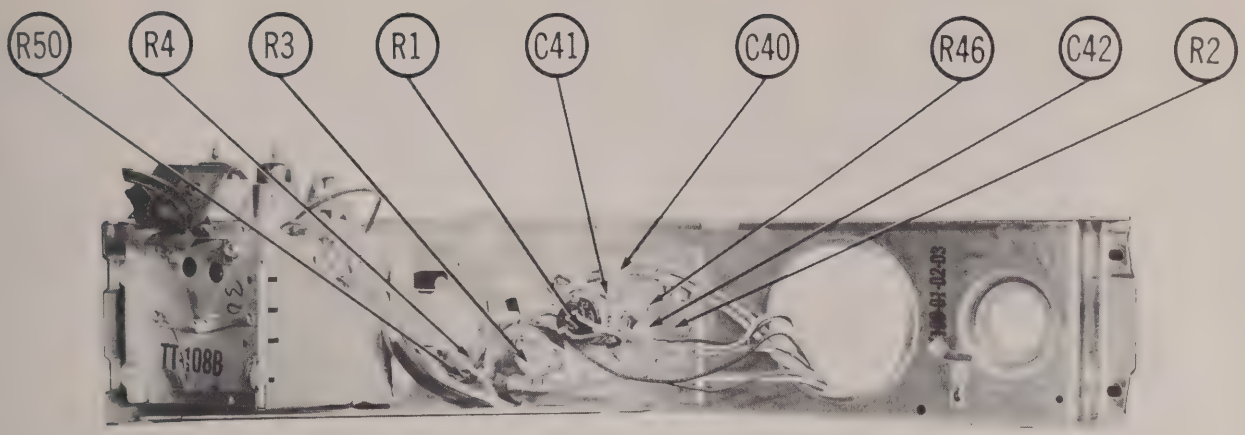
† Part of M201 (Part #1V747644).

COMPONENT COMBINATIONS

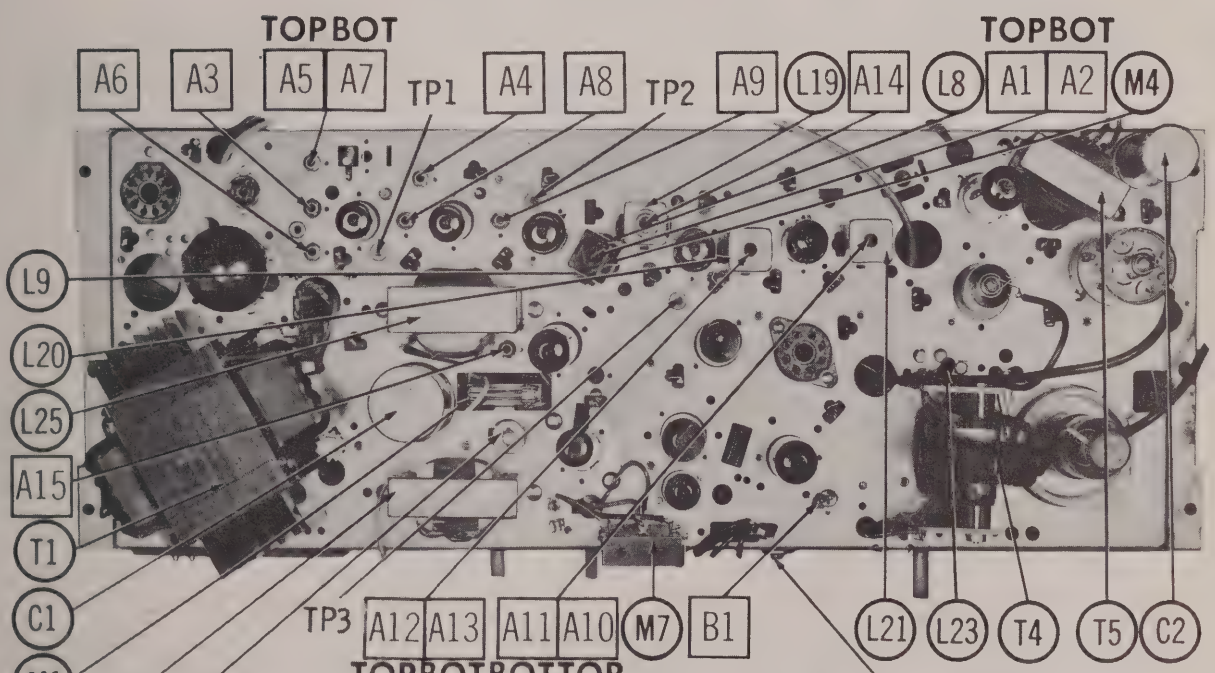
ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K201	Antenna Network	10mmf, 22mmf, 470K	51C747535	
K202	Antenna Network	10mmf, 22mmf, 470K	51C747535	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Antenna Network	1V747644	High Pass Filter Assy.



REMOTE CONTROL PANEL



TP1	125V	1st VIDEO IF SCREEN			
TP2	0V	3rd VIDEO IF GRID			
TP3	-1V	VIDEO OUTPUT GRID			
TP4	-.65V	AGC			
TP5	220V	HORIZ MULT	TP7	.8V	AFC
TP6	0V	GROUND	TP8	260V	B+

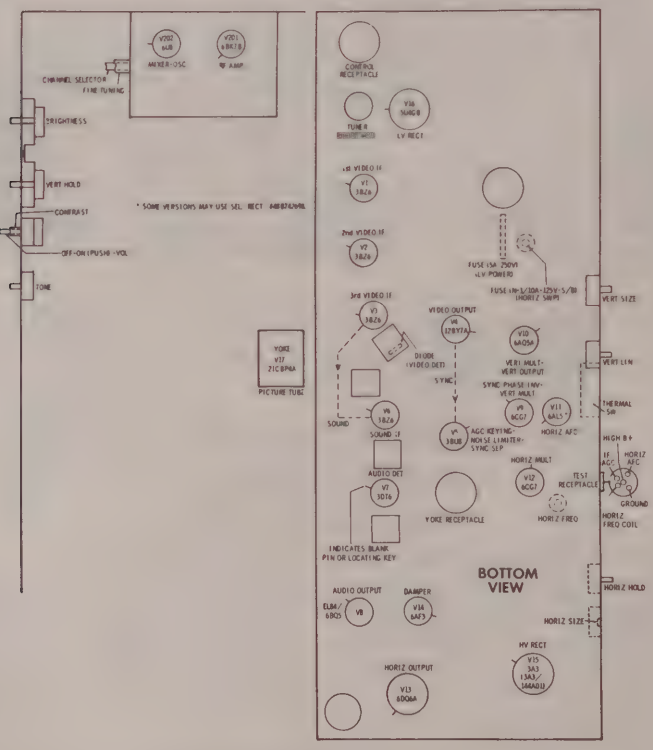
CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

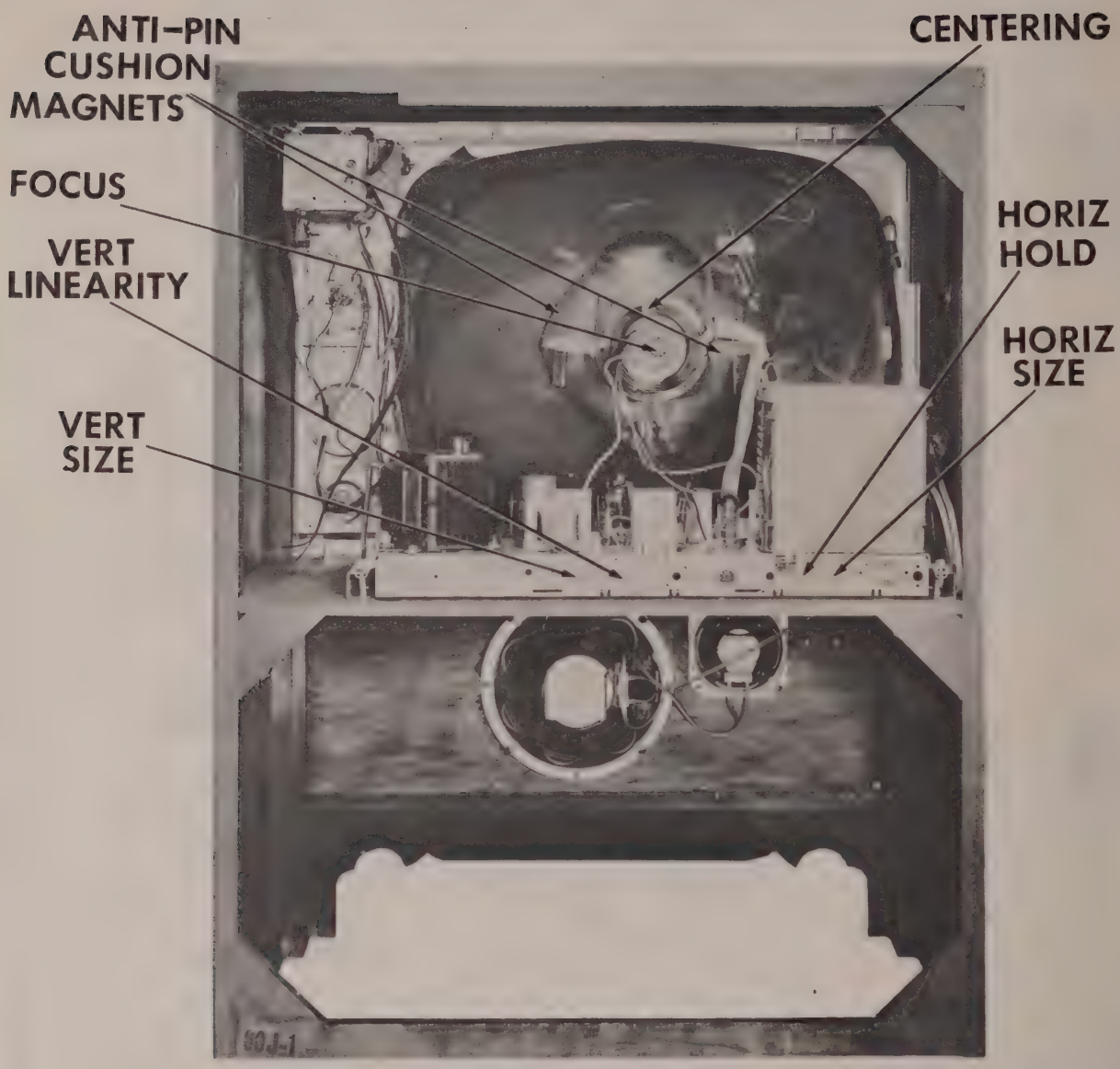
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	600K	47Ω	.1Ω	.4Ω	†8200Ω	†8200Ω	0Ω		
V2	3BZ6	600K	47Ω	0Ω	.4Ω	†8200Ω	†8200Ω	0Ω		
V3	3BZ6	1000Ω	120Ω	.4Ω	0Ω	†8200Ω	†47K	0Ω		
V4	12BY7A	•40Ω	72K	0Ω	.1Ω	.1Ω	0Ω	†5600Ω	†10K	0Ω
V5	3BU8	†3900Ω	†47K	2.2meg	.1Ω	.4Ω	†39K	†860K	†2.5meg	†3.7meg
V6	3BZ6	4700Ω	220Ω	.1Ω	.4Ω	†11K	†70K	0Ω		
V7	3DT6	8Ω	560Ω	.4Ω	0Ω	†390K	†22K	560K		
V8	EL84/ 6BQ5	0Ω	0Ω	180Ω	.1Ω	0Ω	NC	†1000Ω	NC	†470Ω
V9	6CG7	•†1.5meg	•1.6meg	0Ω	0Ω	.1Ω	†33K	56K	2200Ω	0Ω
V10	6AQ5A	•1.5meg	0Ω	0Ω	.1Ω	†600Ω	†150Ω	•1.5meg		
V11	6AL5	12Ω	12Ω	.1Ω	0Ω	4.8meg	0Ω	4.8meg		
V12	6CG7	†60K	•65K	1000Ω	0Ω	.1Ω	†12K	9.4meg	1000Ω	NC
V13	6DQ6A	TP	Ω	NC	•†12K	1meg	TP	.1Ω	12Ω	TOP CAP †11.5Ω
V14	6AF3	NC	†2.5Ω	NC	0Ω	.1Ω	NC	NC	†2.5Ω	†2.5Ω
V15	3A3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †260Ω
V16	5U4GB	NC	¶	NC	17Ω	NC	19Ω	NC	¶	
V17	21CBP4A	0Ω	100K	Pin 6 †360K	Pin 10 †360K	Pin 11 • 250K	Pin 12 .1Ω			
V201	6BK7B	†470	INF	INF	0Ω	.1Ω	INF	3.3meg	0Ω	0Ω
V202	6U8	†12K	44K	†270K	0Ω	.1Ω	†15K	0Ω	0Ω	15K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE.
‡ MEASURED FROM TOP CAP OF V14.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
GENERAL CEMENT #8271, 8273, 8275, 8276, 8721, 8722, 9150, 9298, 5003
WALSCO #2516, 2519

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust the Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold until the picture is synchronized horizontally.

Adjust the Horizontal Size control for a picture slightly wider than necessary to fill the picture mask horizontally.

PHOTOFACT Folder

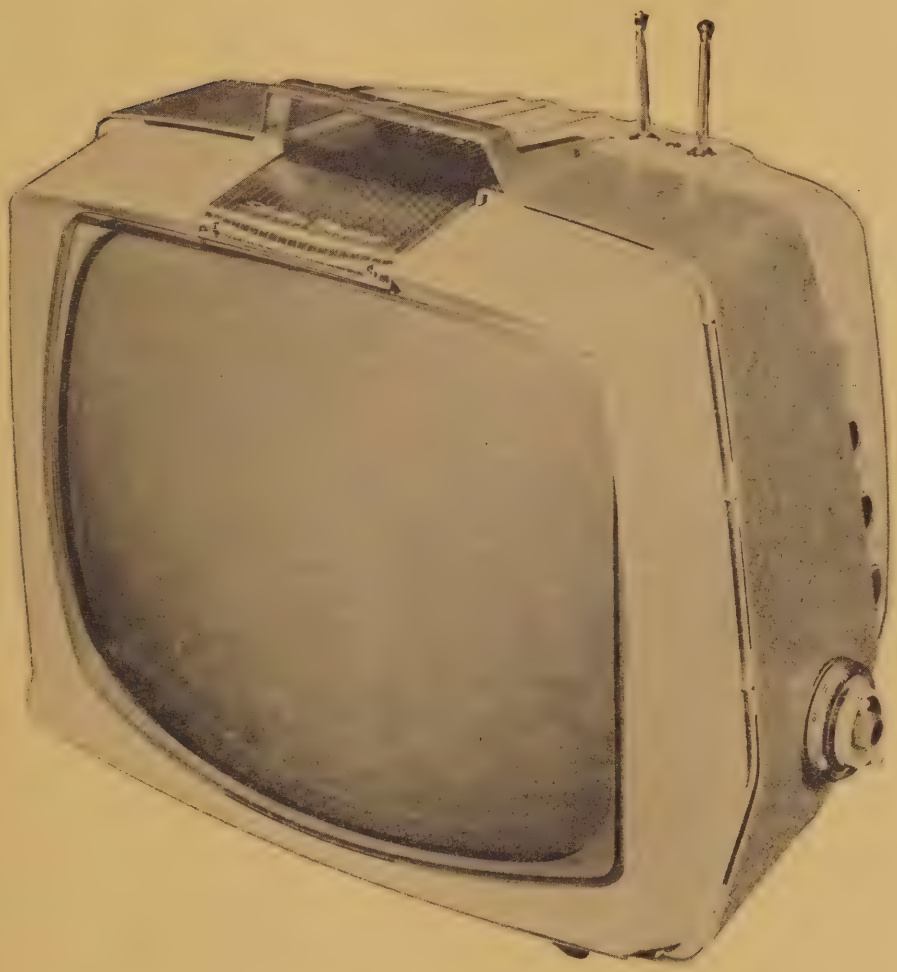
with CIRCUITRACE*

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551



MODEL 9105AQ (Ch. 528. 51550)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PHOTOFACT* Folder with CIRCUITRACE*

SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type knobs from the side.
2. Remove 4 metal screws holding rear cover. Remove the rear cover.
3. Remove picture tube socket, yoke plug and speaker leads.
4. Remove 2 metal screws holding side control bracket.
5. Remove 2 metal screws holding top chassis brackets. Lift chassis up to clear bottom bracket slots and partially remove from cabinet. Remove HV lead.
6. Remove chassis.

MODEL 9105AQ (Ch. 528.51550)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner

TRADE NAME	Silvertone	MODELS	CHASSIS	MODELS	CHASSIS
		PC-9104AQ, GY, TA	456.51340	9104AQ, GY, TA	528.51340
		PC-9104AQ, GY, TA, PC-9118A	456.51540	9104AQ, GY, TA, 9118A	528.51540
			456.51541		528.51541
		PC-9105AQ, GY, TA	456.51350	9105AQ, GY, TA	528.51350
		PC-9105AQ, GY, TA, PC-9119A	456.51550	9105AQ, GY, TA, 9119A	528.51550
			456.51551		528.51551

SUPPLIER Sears, Roebuck & Co., 925 S. Homan Avenue, Chicago, Illinois
TYPE SET Television Receiver
TUBES VHF-Sixteen, UHF-Seventeen
POWER SUPPLY 110-120 Volts AC, 60 Cycle RATING 165 Watts, 1.6 Amp. @ 117 Volts AC
TUNING RANGE Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT ACCESSIBILITY

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover.

SAFETY GLASS REMOVAL

Remove 5 metal screws holding metal plate at top edge of safety glass. Slide top of safety glass outward and lift up to remove.

LOCAL-DISTANCE

Observe the picture and advance the Local-Distance control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet Rear View".)

WIDTH

The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture slightly larger than necessary to fill the screen.

HIDDEN ADJUSTMENTS

The Height and Vertical Linearity adjustments are accessible by removing the Brightness and Vertical Hold knobs.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency coil is used as the Horizontal Hold control. Adjust the Horizontal Hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A Circuit Breaker is used for LV power supply protection and may be reset by depressing the reset button. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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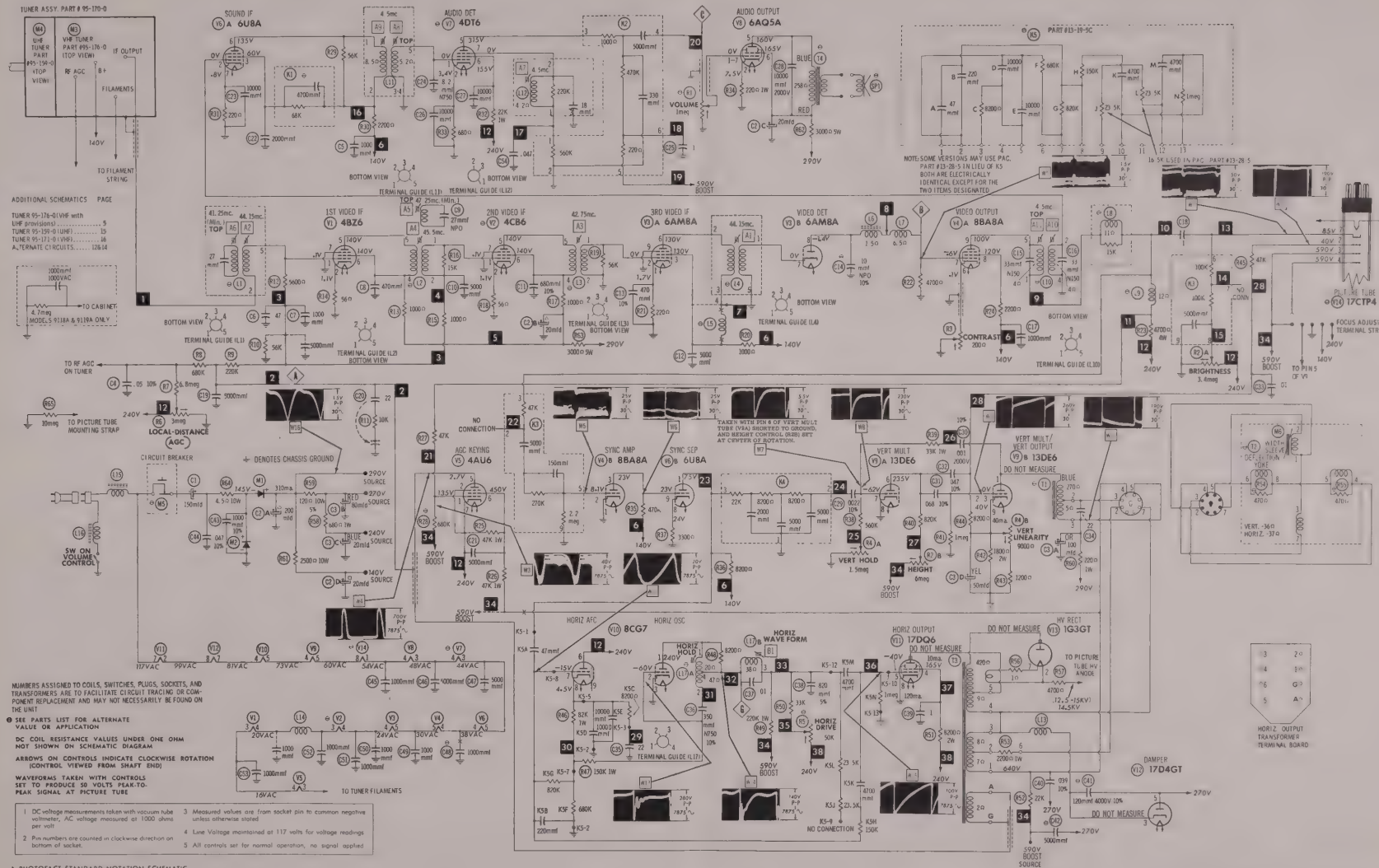
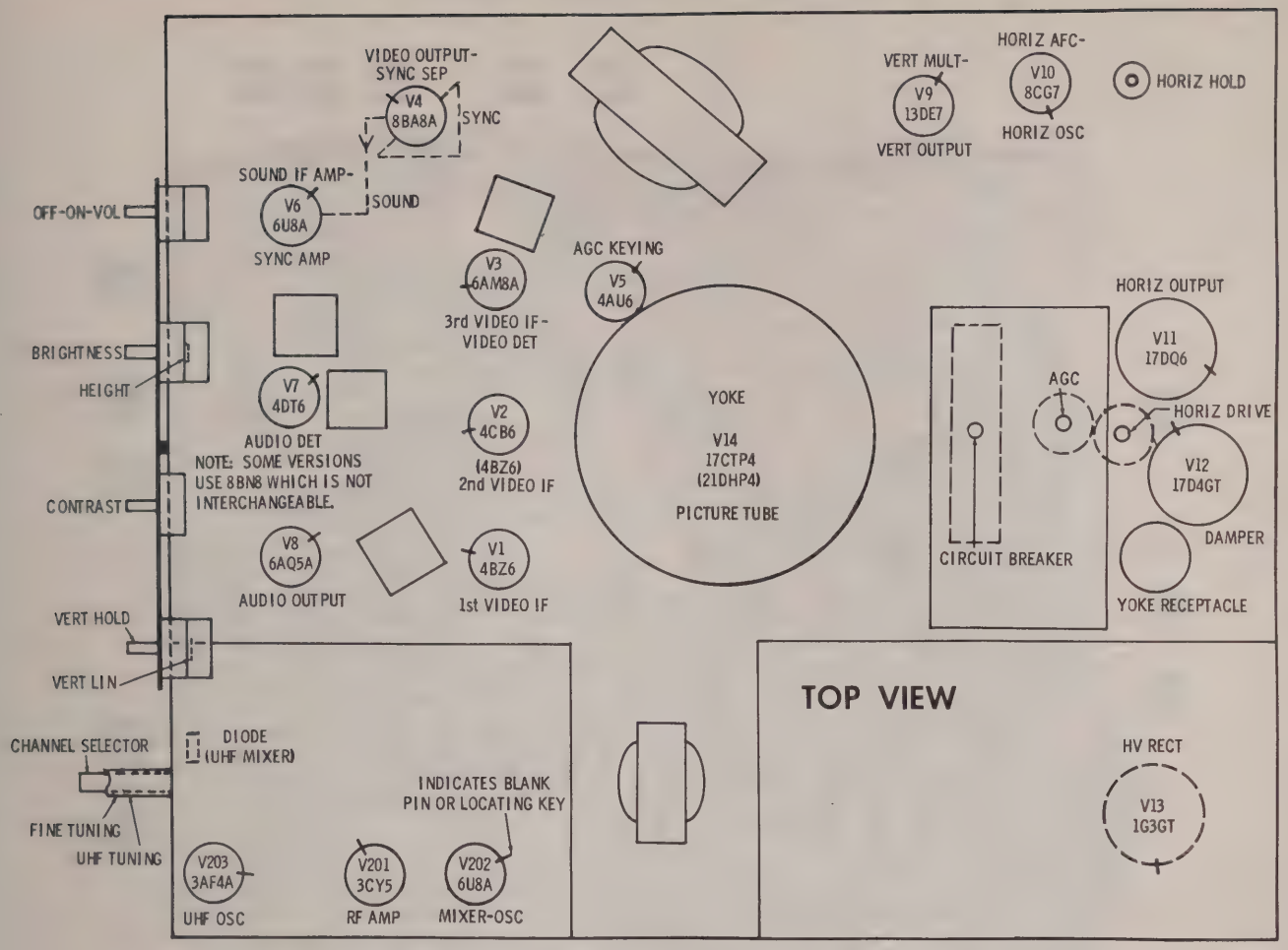
SET 440 FOLDER 2


TUNER ASSY. PART # 95-170-0
SOUND IF
AUDIO DET
AUDIO OUTPUT
VOLUME
1meg
ADDITIONAL SCHEMATICS PAGE
TUNER 95-176-0 (VHF with UHF provisions) 5
TUNER 95-159-0 (UHF) 15
TUNER 95-171-0 (VHF) 16
ALTERNATE CIRCUITS ..... 12&14
1ST VIDEO IF
2ND VIDEO IF
3RD VIDEO IF
VIDEO DET
VIDEO OUTPUT
CONTRAST
BRIGHTNESS
FOCUS ADJUST
TERMINAL STRIP
TO CABINET
MODELS 9118A & 9119A ONLY
TO RF AGC ON TUNER
TO PICTURE TUBE MOUNTING STRAP
LOCAL-DISTANCE (AGC)
CIRCUIT BREAKER
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
AGC KEYING
SYNC AMP
SYNC SEP
VERT MULT
VERT OUTPUT
VERT LINEARITY
VERT HOLD
HEIGHT
HORIZ AFC
HORIZ OSC
HORIZ HOLD
HORIZ WAVE FORM
HORIZ OUTPUT
HV RECT
DAMPER
TO PICTURE TUBE HV ANODE
HORIZ OUTPUT TRANSFORMER TERMINAL BOARD
TO TUNER FILAMENTS
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1959
SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

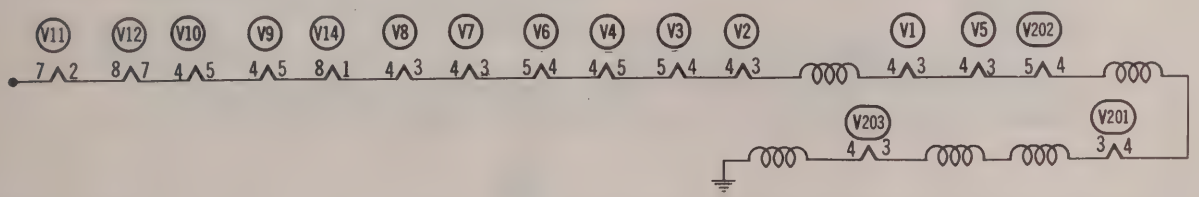
POWER SUPPLY FAILURE
No raster, no sound Rectifier (B+)

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V14, Rect. (B+)
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, Rectifier (B+)
Vert. off freq. V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, V4
No pic, no sound, has snow V201, V202, V1, (V203 UHF only)
No pic, has sound, has raster V4, V14
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V4, V6
No horiz. sync V4, V6, V10
No vert. or horiz. sync V4, V6

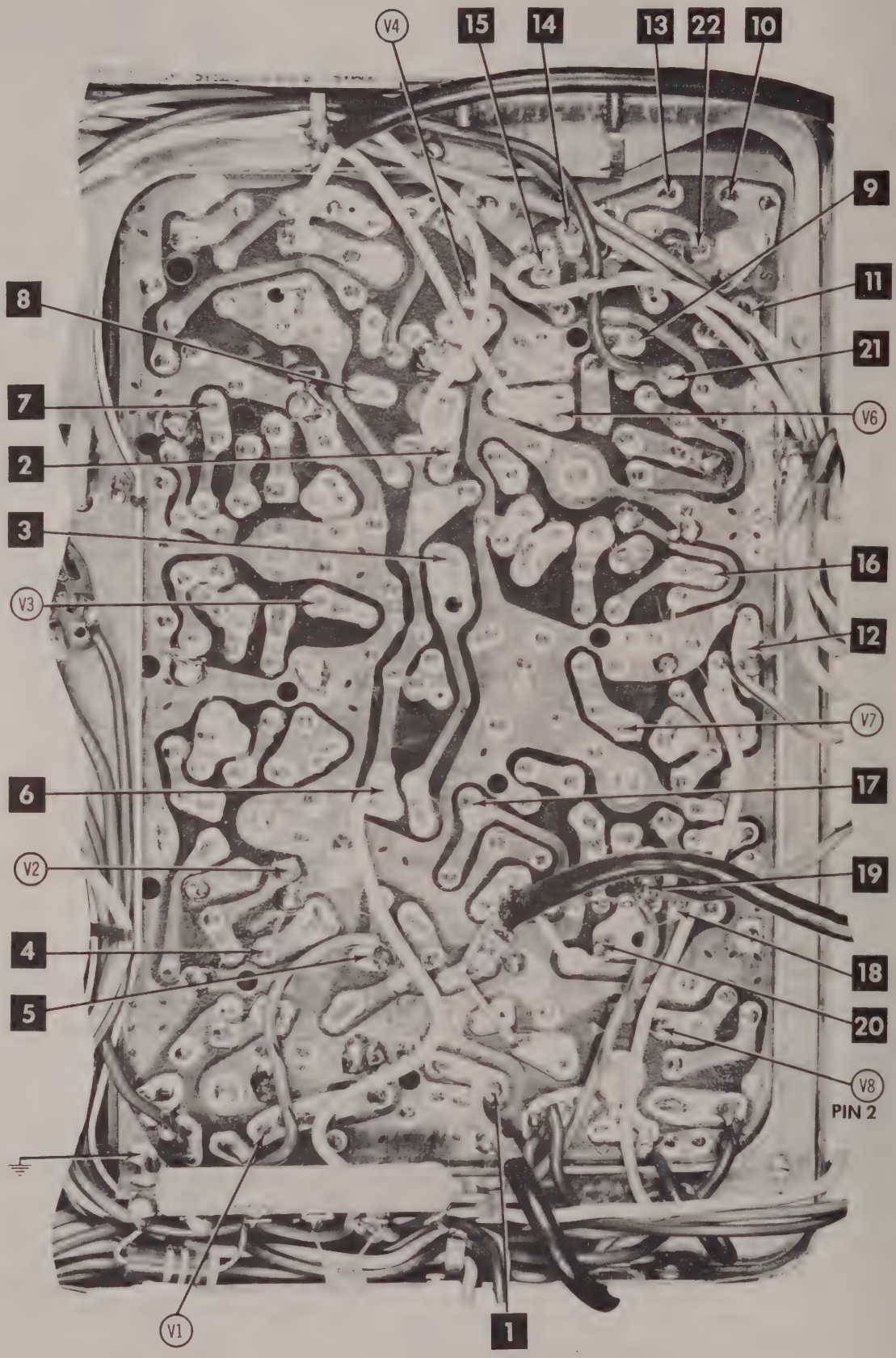
This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

FOLDER 2

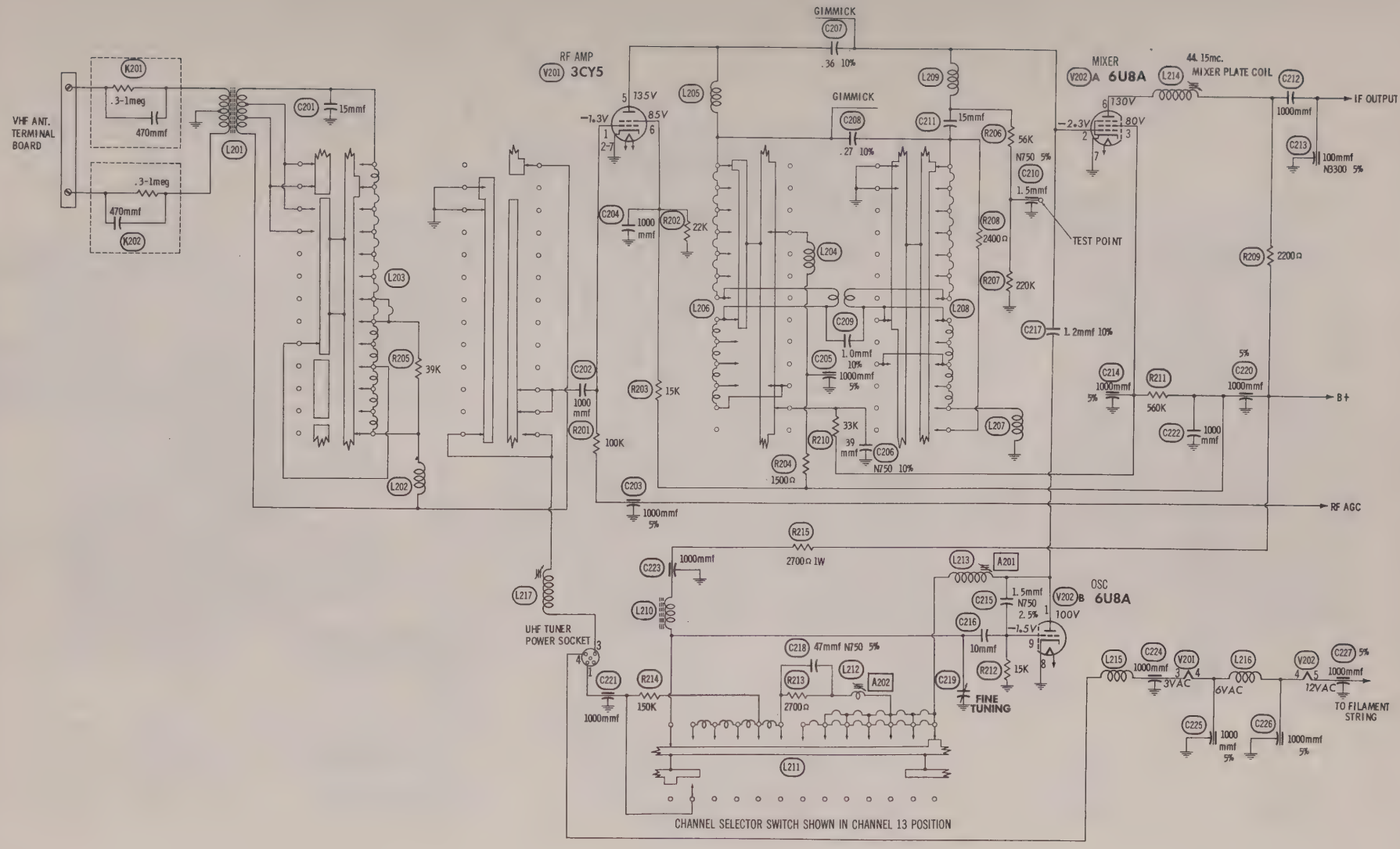
CircuiTrace Numbers 1 thru 22



A Howard W. Sams CIRCUITRACE* Photo

MAIN PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER with UHF provisions 95-176-0

SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

TUNER PARTS LIST AND DESCRIPTIONS

95-170-0

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	3CY5	
V202	Mixer-Osc.	6U8A	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	3AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	15			222-150	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5GA-Q15	
C202	1000			2033-23	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C203	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C204	1000			2033-23	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C205	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C206	39		N750 5%	233-390					5TCU-Q39S 5%*	
C207	.36		10%	2101-368						
C208	.27		10%	2101-278						
C209	1.0		10%	2101-109	NPO-SI 1.0	TCZ-1		CNO-510	5TCCB-V1S 10% *	
C210	1.5		N750 5%	259-159						
C211	15			222-150	NPO-DI 15	DTZ-15	C10Q150	CNO-415	5GA-Q15	
C212	1000			2033-23	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C213	100		N3300 5%	262-101						
C214	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C 215	1.5		N750 2.5%	170-159		TCZ-1R5				
C216	10			164-100	NPO-DI 10	DD-100	C10Q1C	CNO-410	5GA-Q1	
C217	1.2		10%	2101-129					5TCCB-V12S 10%*	
C218	47		N750 5%	233-470	N750-DI 47	DTZ-47		CN7-447	5TCU-Q47S 5% *	
C219				5322-505						
C220	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C221	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C222	1000			2033-23	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C223	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C224	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C225	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C226	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C227	1000		5%	244-1	EF-001	MFT-1000			503C-D1	
C228										
C229										
C230	1000			2033-23	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C231	18					DD-180	C10Q18C	CNO-418	5TCU-Q18S *	①
C232	.91		10%	2101-918						
C233				1620-9						
C234	1.5		N470 ± .25mmf							②
C235				5180-2						
C236	1000			206-102	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C237	1000			244-1	EF-001	MFT-1000			503C-D1	
C238	15			138-5	NPO-DI 15	DTZ-15	C10Q15C	CNO-415	5HK-D1	
C239	1000		5%	244-1	EF-001	MFT-1000			503C-D1	

① Some versions may use 40mmf in this application (Part #221-400).
② Not used in some versions.
* Not normally in distributors stock. Available through distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R201	100K		106-104	
R202	22K		106-223	
R203	15K		106-153	
R204	1500Ω		106-152	
R205	39K		106-393	
R206	56K		106-563	
R207	220K		106-224	
R208	2400Ω		106-242	
R209	2200Ω		106-222	
R210	33K		106-333	

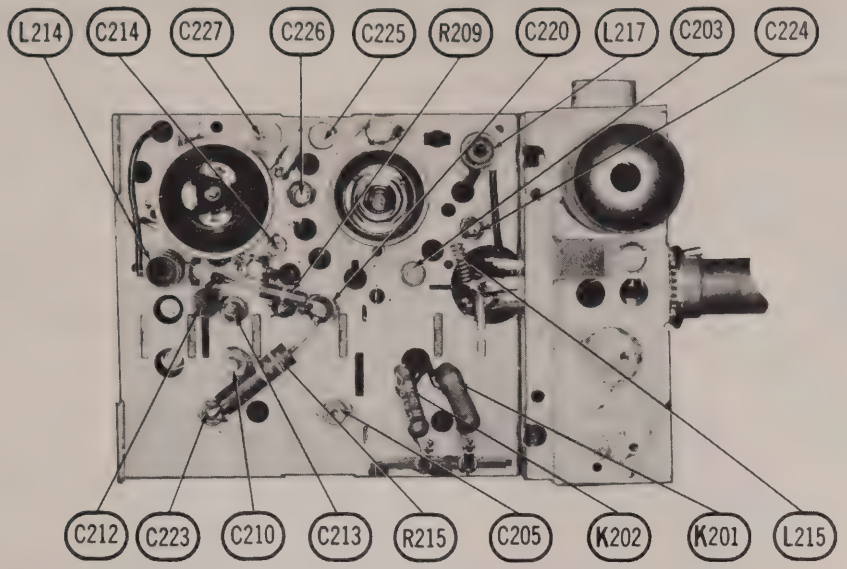
ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R211	560K		106-564	
R212	15K		106-153	
R213	2700Ω		106-272	
R214	150K		106-154	
R215	2700Ω	1	107-272	
R216	820K		110-824	
R217	150Ω		106-151	
R218	6800Ω		106-682	
R219	1000Ω		106-102	

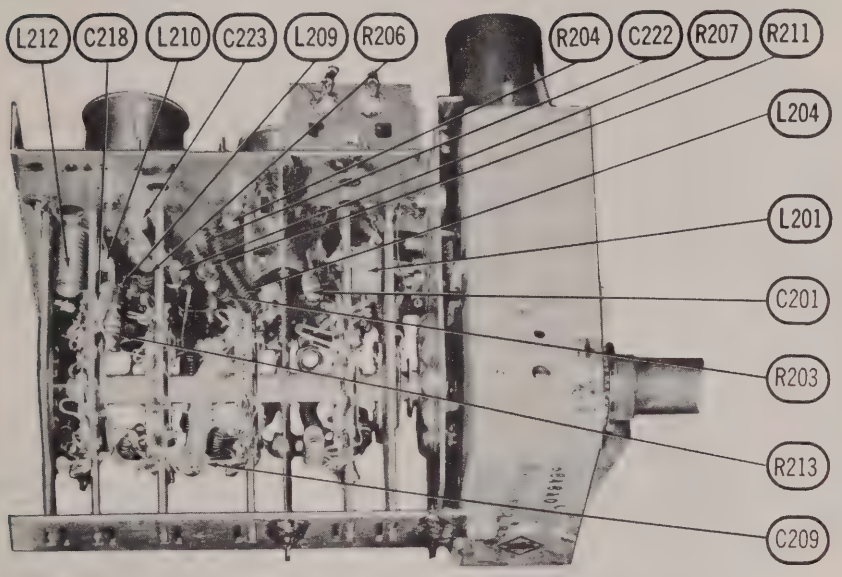
COILS (RF-IF)

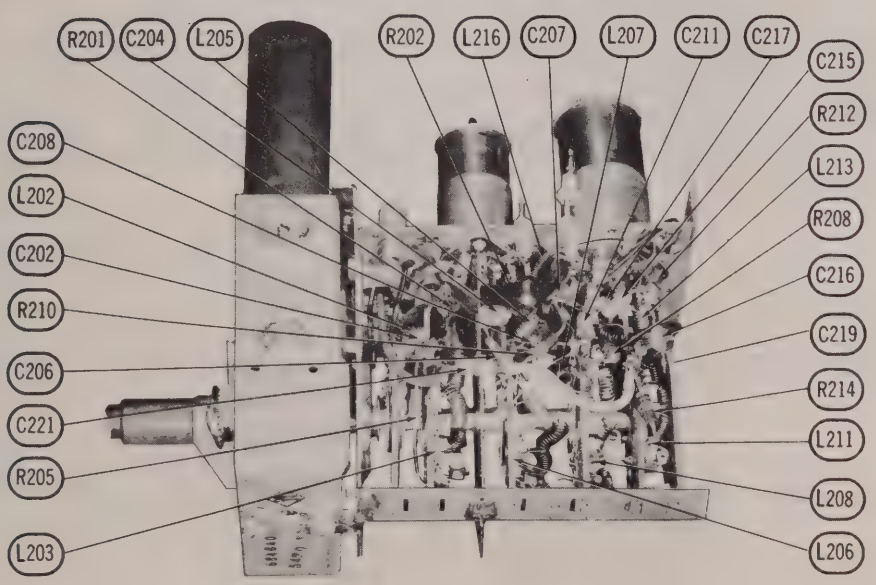
ITEM No.	USE	SILVERTONE PART No.	NOTES
L201	VHF Ant. Trans.	2309-4	
L202	RF Choke	300-3	
L203	Ant. Coils	2876-501	Channel 2-13, Includes wafer assy.
L204	RF Choke	301-25	
L205	RF Choke	301-8	
L206	RF Coils	2877-501	Channel 2-13, Includes wafer assy.
L207	RF Choke	301-25	
L208	Mixer Grid Coils	2878-501	Channel 2-13, Includes wafer assy.
L209	RF Choke	301-5	
L210	RF Choke	1894-9	

ITEM No.	USE	SILVERTONE PART No.	NOTES
L211	Osc. Coils	2879-501	Channel 2-13, Includes wafer assy.
L212	Osc. Tuning	5381-15	
L213	Osc. Tuning	5381-1	
L214	Mixer Plate	5359-5	
L215	Fil. Choke	301-10	
L216	Fil. Choke	301-10	
L217	UHF IF Output	5251-12	
L218	Fil. Choke	1785-70	
L219	Fil. Choke	1785-70	
L220	Cathode Choke	1911-12	
L221	RF Choke	1785-9	
L222	RF Choke	1785-13	
L223	RF Choke	1785-13	
L224	RF Choke	301-6	

continued PAGE 15







UHF-VHF TUNER 95-170-0

SET 440 FOLDER 2

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Short the antenna leads together but not to chassis.
Connect the negative lead of a 3 volt bias supply to point (A). Positive to chassis.
Detune Mixer Plate Coil by turning core fully counterclockwise.
Detune A2, A4, A5 and A6 by presetting for maximum core separation.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.15MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (B). Common to chassis. (Across Video Det. load)	A1, A2, & Mixer Plate Coil	Adjust for maximum deflection.
2.	"	"	42.75MC	"	"	A3	"
3.	"	"	45.5MC	"	"	A4	"
4.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 3 and 4.
5.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Short antenna terminals together but not to chassis.
Attenuate sweep generator output to maintain not more than 2 volts peak to peak on the scope (-3 volts DC at point (B)).
If separate marker generator is used, couple loosely to the sweep cable.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.15MC (10MC Swp)	41.25MC 42.5MC 43.5MC 44.15MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10K to point (B). Low side to chassis.		Check for response similar to Fig. 1. Retouch Mixer Plate Coil if necessary to place 45.75MC marker at 50%. A2 may be retouched for correct tilt.

SOUND IF ALIGNMENT FOR QUADRATURE COIL CIRCUITS

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001mfd	High side to point (B). Low side to chassis. Use high output.	4.5MC (400% FM 15KC Swp)	Any non-interfering channel	AC probe to point (C). Common to chassis.	A7, A8	Adjust A7 for maximum deflection. (If two peaks occur, use highest peak). Adjust A8 for maximum deflection. Retouch A7.
8.	"	"	"	"	"	A9, A10, A11	Reduce output to 500 microvolts. Adjust A9, A10 and A11 for maximum deflection, Keep reducing generator signal to keep VTVM reading from exceeding 4.5 volts.

SOUND IF ALIGNMENT FOR RATIO DETECTOR CIRCUITS

Connect two matched 100K (±1%) resistor in series from point (D) to chassis. The junction of these two resistors is alignment point (E) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (F). Common to point (E).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and check the picture tube for evidence of 4.5MC beat interference. If necessary, retouch A11 until the horizontal scanning lines are smooth and continuous.

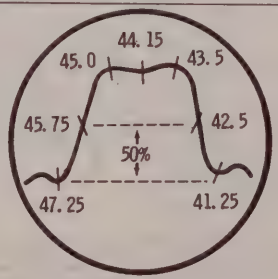
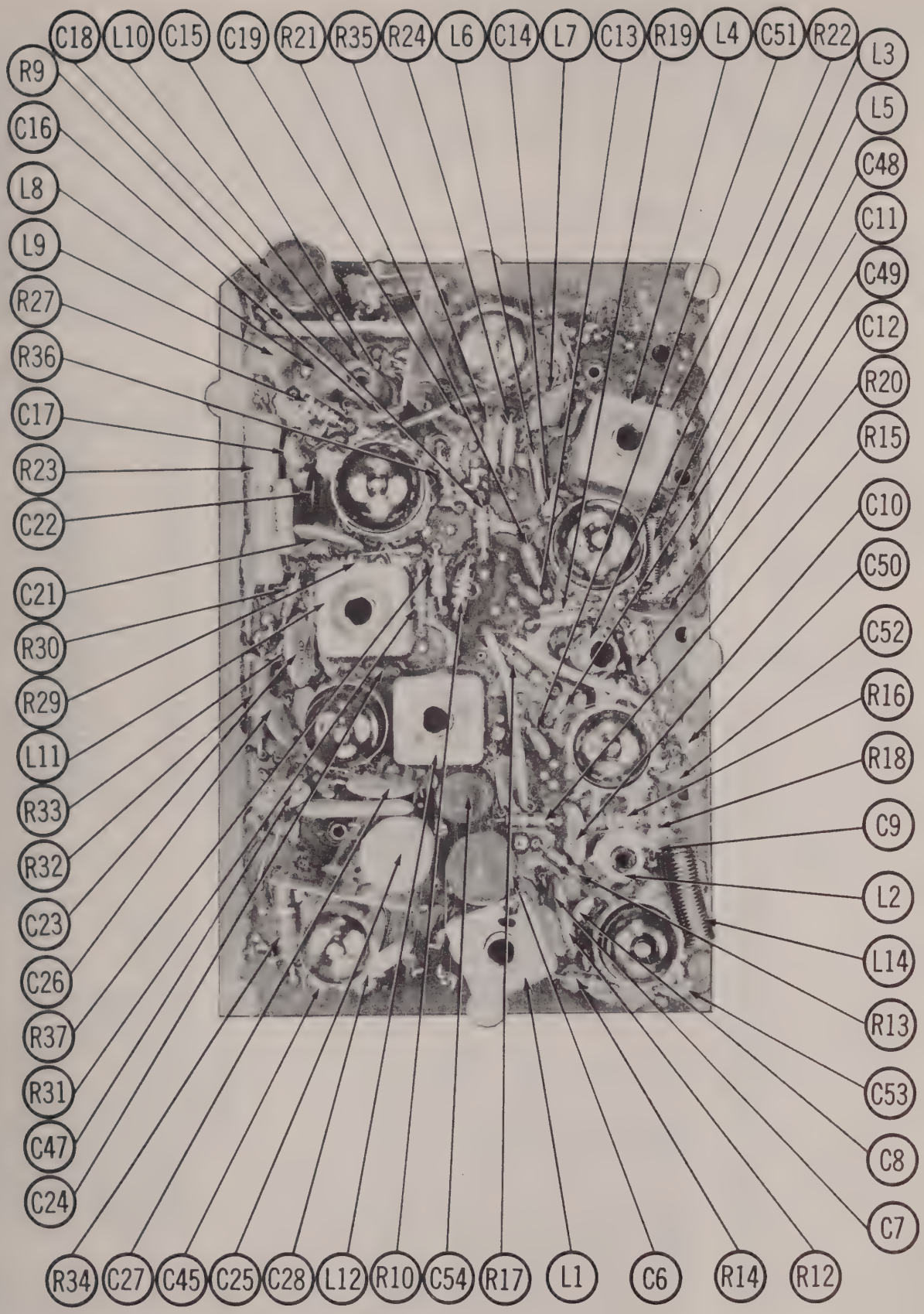


FIG. 1

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 15



MAIN PRINTED BOARD

SET 440 FOLDER 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	4BZ6	
V2	2nd Video IF Amp.	4CB6	4BZ6*
V3	3rd Video IF Amp. - Video Det.	6AM8A	
V4	Video Output-Sync Sep.	8BA8A	
V5	AGC Keying	4AU6	
V6	Sound IF Amp. -Sync Amp.	6U8A	
V7	Audio Det.	4DT6	Note 1
V8	Audio Output	5AQ5A	
V9	Vert. Multi.-Vert. Output	13DE7	
V10	Horiz. AFC-Horiz. Osc.	8CG7	
V11	Horiz. Output	17DQ6	
V12	Damper	17D4GT	
V13	HV Rect.	1G3GT	

Note 1. Ch. 456./528.51340, 350 use an alternate circuit using an 6BN8. These tubes are not interchangeable.
* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	SILVERTONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V14	17CTP4 21DHP4			17CTP4 ① 21DHP4 ①	① "Silver Screen 65"

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	160	18-73-5	PRS250V150	BR2505	TC495	TD-150-150	TVA-1422	
C2A	▲200	320	18-69-5	AFH4-02-90	D0026	FP419.54	TMQ-118	TVL-4590	
B	▲20	300							
C	20	300							
D	▲20	300							
C3A	100	300	18-79-5		D00474			TVAS-5480.5*	
B	80	300			BR2035				
C	20	300							
D	50	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.05	200	10%	18-47323			PM285		2WF-858*	
C5	1000			20-65-0	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C6	.47	100		20-117-1	P288N-47		BC2P47J		3SE-P47	
C7	1000			18-10217	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C8	470			20-66-0	BPD-00047	DD-471	BYA10T47	B-347	5GA-T47	
C9	27		NPO		NPO-DI 25	DTZ-27	C10G27C	CNO-427	5TCC-G27S *	
C10	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C11	680		10%	20-116-0	DI-680	D6-681		JL-368	5GA-T68S 10% *	
C12	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C13	470		10%	20-66-0	DI-470	D6-471		JL-347	5GA-T47S 10% *	
C14	10		NPO 10%	20-23-0	NPO-DI 10	DTZ-10	C10G10C	CNO-410	5TCC-G1S 10% *.	①
C15	33		N150							
C16	33		N150							
C17	1000			18-10217	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C18	.1	400		20-42-1	P488N-1	DF-104	BC4P1J	ACE401	4TM-P1	
C19	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C20	.22	200		18-22423	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C21	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C22	2000			20-69-0	BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C23	10000			20-86-0	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	8.2		N750	20-118-0			C10V82U		5TCU-V82S 10% *	
C25	.1	600		20-134-1	P688N-1	DF-104	BC6P1J	ACE601	6HK-P10	
C26	10000			20-86-0	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C27	10000			20-86-0	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	1000	3000		18-75-0	HVD-30-1000	DC30-102	GVB3D1M		30GA-D1	
C29	.0022	400	10%	20-119-1			PM6D22	GTM-4222	5BF-D22	
C30	.001	2000	10%	20-118-1						
C31	.068	400	10%	20-120-0			PM4S6	GTM-4168	5BF-S68	
C32	.047	400	10%	20-121-1			PM4S47	GTM-4147	5BF-S47	
C33	.01	600		20-19-1	P688N-01	DD-103	CUB6S1	GEM-611	6TM-S1	
C34	.22	200		18-22423	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C35	.22	200		18-22423	P288N-22		CUB2P22	GEM-2022	2TM-P22	
C36	350		N750 10%	20-73-0						
C37	.01	600		20-19-1	P688N-01	DD-103	CUB6S1	GEM-611	6TM-S1	
C38	820		5%	20-13-2	1469-00082		5WST82		5GS-382	
C39	.1	600			P488N-1	DF-104	BC4P1J	ACE-401	4SE-P10	
C40	.039	600	10%	20-123-1					6TM-S39S 10%*	
C41	120	4000	10%	18-12416						②
C42	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	③
C43	1000		10%	20-65-0	DI-1000	DD-102		JL-210	5GA-D1S 10% *	
C44	.047	600	10%	18-47353			PM6S47	GTM-6147	6TM-S47S 10% *	
C45	1000			18-10217	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C46	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C47	5000			18-50217	BPD-005	DD-502	BYA10D5	B-250	5HK-D5	
C48	1000			20-65-0	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	④
C49	1000			18-10217	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C50	1000			18-10217	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C51	1000			18-10217	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C52	1000			18-10217	BPD-001	DD-102	BYA10D1M	B-210	5HK-D1	
C53	1000			18-10217	BPD-001	DD-103	BYA10D1M	B-210	5HK-D1	
C54	.047	400			P488N-047	DF-503	BC6S47J	ACE-6147	2SE-S47	

① Ch. 456./528.541, 551 use 4.7mmf NPO 10% in this application (Part 20-23-0).
② Some versions may use a different value. Replace with value used in set.
③ Ch. 456./528.541, 551 use 10000mmf in this application (Part #20-86-0).
④ Not used in Ch. 456./528.51340, 350.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No	CENTRALAB PART No.	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1meg	½	24-314-0	B-70	A47-1meg-Z	Q13-137	U53	Volume, Note 1
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
C	Switch			KS-1	SWE-12	76-1	U6-26	
R2A	3.4meg	½	24-118-1	F1-78		† Q7997	†† UE3951	Brightness
B	6meg	½		R2-63 †				Height
R3A	200Ω	½	24-135-1	F1-0			FA32L	Contrast
B	Shaft			Not Req.			O3687	
R4A	1.5meg	½	24-137-1	F1-64		■ Q7996	▲ UE3962	Vert. Hold
B	9000Ω	½		R2-25 †				Vert. Lin.
R5A	50K	½	24-138-1	BX-31	B47-50K-S	BU1-123	PTA54L	Horiz. Drive, Note 2
B	Shaft			Not Req.	Not Req.	TM-2	Not Req.	
R6A	3meg	½	24-135-1	BX-84	B47-3meg-S	BU1-140	PTA35L	Local-Distant (AGC)
B	Shaft			Not Req.	Not Req.	TM-2	Not Req.	

Note 1. Chassis 456./528.51540, 541, 551 and some versions of Chassis 546./528.51550 may use Part #24-322-0.
Note 2. Some versions may use 80K (Part #24-139-1).
† Cut and split inner shaft before assembling.
†† "Concentrikit" Equivalent: K-2 Kit with Base Elements & Shafts: BU1-140, P1-020 (Panel) (Not available as a factory assembled unit.) BU1-141, R15-005 (Rear)
■ "Concentrikit" Equivalent: K-3 Kit with Base Elements & Shafts: BU1-138, P1-020 (Panel) (Not available as a factory assembled unit.) BU7-116, R15-005 (Rear)
▲ "STA-LOC" Equivalent: FA35L, O8687, RU14R, I3437.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise noted.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R7	6.8meg		60-68502	
R8	680K		60-68401	
R9	220K		60-22401	
R10	56K		60-56301	
R11	10K		60-10301	
R12	5600Ω		60-56201	
R13	1000Ω		60-10202	
R14	56Ω		60-56001	
R15	1000Ω		60-10202	
R16	15K		60-15301	
R17	1000Ω		60-10202	
R18	56Ω		60-56001	
R19	56K		60-56301	
R20	1000Ω		60-10202	
R21	220Ω		60-22101	
R22	4700Ω		60-47201	
R23	4700Ω	4	65-5-1	
R24	22000Ω		60-22202	
R25	47K	1	60-47311	
R26	47K	1	60-47311	
R27	47K		60-47301	
R28	680K		60-68401	
R29	56K		60-56301	
R30	2200Ω		60-22202	
R31	220Ω		60-22101	
R32	22K	1	60-22311	
R33	680Ω		60-68101	
R34	220Ω	1	60-22111	
R35	470K		60-47402	
R36	8200Ω		60-82201	

Note 1. Value may vary. Replace with value in set.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No	NOTES
R37	3300Ω		60-33301	
R38	560K		60-56401	
R39	33K	1	60-33311	
R40	820K		60-82401	
R41	1meg		60-10501	
R42	1800Ω	2	60-18221	
R43	1200Ω		60-12201	
R44	8200Ω		60-82301	
R45	47K		60-47301	
R46	82K	1	60-82311	
R47	150K	1	60-15411	
R48	8200Ω		60-82201	
R49	220K	1	60-22411	
R50	33K		60-33301	
R51	8200Ω	2	60-82221	
R52	22K		60-22301	
R53	8200Ω	1	60-82202	
R54	470Ω			Note 1
R55	470Ω			Note 1
R56	1Ω		61-142-0	
R57	4700Ω		60-47202	
R58	680Ω	1	60-68111	
R59	1200 5%	10	61-134-0	
R60	220Ω	1	60-22112	
R61	2500Ω	10	61-129-0	
R62	3000Ω	5	61-141-0	
R63	3000Ω	5	61-141-0	
R64	4.5Ω	10	61-115-0	
R65	10meg		60-10602	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No	NOTES
L1A	1st Video IF	10-25-3					①
B	41.25MC Trap						
L2A	2nd Video IF	10-21-3					②
B	47.25MC Trap						
L3	3rd Video IF	10-22-3					③
L4	4th Video IF	10-24-3					④
L5	RF Choke						⑤
L6	Resonant Choke	10-65-1					12 Microhenries
L7	Series Peaking Coil	10-64-1		TV-193	6110		80 Microhenries
L8	Series Peaking Coil	10-66-1	19-3250 *	TV-198 *	6130 *	VP-5 *	270 Microhenries, wound on 15K resistor ⑥
L9	Shunt Peaking Coil	10-86-1	19-3250	TV-198	6130	VP-5	270 Microhenries ⑦
L10	1st Sound IF	10-152-1					⑧
L11	2nd Sound IF	10-23-3					
L12	Quadrature Coil	10-17-5					
L13	RF Choke		19-1002	BC-563	4606		2.5 Microhenries
L14	Fil Choke	10-122-1	19-1002	BC-563	4606		2.3 Microhenries
L15	Line Choke	10-149-1	19-3036	TV-180	6176	VP-1	40 Microhenries
L16	Line Choke	10-149-1	19-3036	TV-180	6176	VP-1	40 Microhenries

① Chassis 456./528.51340, 350 use Part #10-82-2 in this application.
② Chassis 456./528.51340, 350 use Part #10-16-3 in this application.
③ Chassis 456./528.51340, 350 use Part #10-17-3 in this application.
④ Chassis 456./528.51340, 350 use Part #10-83-2 in this application.
⑤ Not used in Chassis 456./528.51340, 350.
⑥ Alternate Part #10-150-1. Use same replacements.
⑦ Alternate Part #10-147-1. Use same replacements.
⑧ Chassis 456./528.51340, 350 use Part #10-146-1 in this application.
* Parallel with 15K Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Rom PART No	Thordarson PART No	NOTES
L17A	67Ω		10-11-5						Horiz. Freq. tapped ①
B	38Ω								470 ①
									Horiz. Waveform.

① Ch.456./528.51340, 350, 540, 550 use Part #10-13-5 in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No	Halldorson PART No.	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	B80-3-2C	21900 ⑫	A-2832 ⑪	V316 ⑫ ⑬	VO-305 ⑭	A-8147 ⑫	26S5 ③	A-11X ③
	Alt. Vert. Output	80-3-2	21900 ⑫	A-2832 ⑪	V316 ⑬ ⑭	VO-305 ⑭	A-8147 ⑫	26S5 ③	A-11X ③
T2	Yoke(Horiz. 21MH) (110°) (Vert.34MH)	80-9-4 ⑥						Y-53	Y-62 & NW-20
	Alternate Yoke	80-7-4						Y-53 ⑦	
	Rear Cover & Centering Device	21-237-0						YC-110	
	Yoke Clamp	22-116-3							
	Alternate Rear Cover	21-404							
	Alternate Rear Cover	21-295-0							
T3	Horiz. Output	80-8-3		X162*1 ⑧	EFR-172 *1 ⑧	HO-304 *1 ⑧	FLY-137 *1 ⑧		

① Connect as autoformer.
② Use 6:1 turns ratio.
③ Drill new mounting hole(s).
④ Cut and tape blanking lead.
⑤ Use 8:1 turns ratio.
⑥ Includes rear cover and centering device, and yoke plug.
⑦ Use original rear cover and centering device. Remove capacitor from yoke terminal #2 and #7. Connect same as original.
⑧ Use original mounting bracket and bolts.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5			5	5	5	5	
4			6	4	6	6	
3			4	6	4	6	
2			See Note ⑨ NC	See Note ⑨ NC	See Note ⑨ NC	See Note ⑨ NC	
1			8	1	8	8	
A			2	7	2	2	
G			1	8	1	1	
			⑨ 11	⑨ 10	⑨	⑨ 11	

⑨ Install new damp. network consisting of 1000Ω and 1000mmf across horizontal yoke terminals #2 and #1.
10 Remove one turn from filament winding.
11 If AGC does not function properly, reverse connections to horizontal output transformer terminals #1 and #2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA SILVERTONE PART No	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordarson PART No	Triad PART No	NOTES
T4	8000Ω	3-4Ω	80-81-1 ①	Z1001	A-2930	AU-601	A-3877	24S51	S-3X	

① Used in Ch. 456./528.51540, 550. Ch. 456./528.51340, 350 use Part #80-83-0.
Ch. 456./528.51541, 551 use Part #80-80-1.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	3" x 5"	PM	3-4Ω	33-379-4 ① 33-383-4 ②		① PC-9104 Series, 9104 Series. ② PC-9118A, PC-9119A, 9118A, 9119A Series.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	SILVERTONE PART No	REPLACEMENT DATA	
K1	Sound IF Screen	4700mmf, 65K	1		
K2	Audio Det.	330mmf 5000mmf, 10000Ω, 220Ω, 475K, 560K.	13-25-3		
K3	Sync Separator Coupling	150mmf 5000mmf, 5000mmf, 47K, 100K, 100K, 270K, 2.2meg	13-24-3		
K4	Vert. Integrator	3000mmf, 5000mmf, 50000mmf, 8200Ω, 8200, 22K	13-36-3	Aerovox Centralab Sprague	PA-111 PC-104 V-2
K5	Horiz. Sweep	47mmf, 220mmf, 10000mmf, 10000mmf, 4700mmf, 4700mmf, 8200Ω, 23.5K, 23.5K, 150K, 680K, 820K, 1meg	13-19-5C ②		

① Some versions may use individual components in this application.
② Some versions may use Part #13-38-5.

SILVERTONE CHASSIS 456.51340, 350, 540, 541, 550, 551, 528.51340, 350, 540, 541, 550, 551

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.310A	86-1-3 ①	HA-504 ①	SD-500 ①	40K ①	① Silicon Type.
M2	.310A	86-1-3 ①	HA-504 ①	SD-500 ①	40K ①	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuner	95-176-0	VHF with UHF provisions, Ch. 456./528.51350, 550, 551
	Tuner	95-171-0	VHF, Ch. 456./528.51340, 350, 540, 541
	Tuner	95-170-0	UHF-VHF (Includes 95-176-0 and 95-159-0), Ch. 456./528.51350, 550, 551
M4	Tuner	95-159-0	UHF, Ch. 456./528.51350, 550, 551
M5	Circuit Breaker	43-1-2	
	Circuit Breaker	43-3-2	Alternate
M6	Width Sleeve	83-1204	
	Magnet	27-70-2	Beam Alignment used in some sets for better focus
	Printed Board	84-7075	Video, Sound IF, Sync, Assembly (Less Tubes), Ch. 456./528.51540, 541, 550
	Printed Board	84-6901	Video, Sound IF, Sync, Assembly (Less Tubes), Ch. 456./528.51340
	Printed Board	84-7275	Video, Sound IF, Sync, Assembly (Less Tubes), Ch. 456./528.51551
	Printed Board	84-7126	Horiz., Vert. Osc., Assembly (Less Tubes), Ch. 456./528.51340, 350, 540, 550
	Printed Board	84-7144	Horiz., Vert. Osc., Assembly (Less Tubes), Ch. 456./528.51541, 551

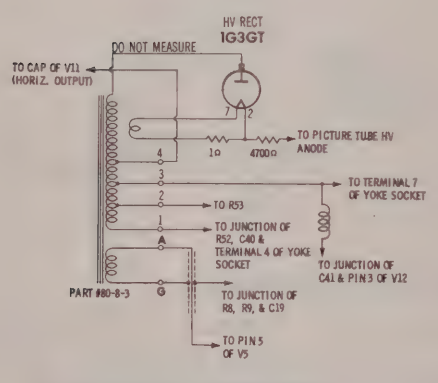
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

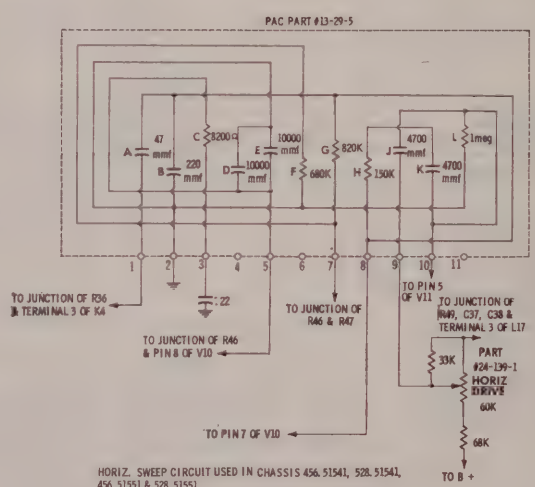
NAME	PART NO.	DESCRIPTION
Safety Glass	48-152-0	9104 Series, 9105 Series, PC-9104 Series, PC-9105 Series
Safety Glass	48-144-0	Models 9118A, 9119A, PC-9118A, PC-9119A
Bezel	40-19-5	Includes mounting hardware, 9104 Series, 9105 Series, PC-9104 Series, PC-9105 Series
Bezel	40-21-5	Models 9118A, 9119A, PC-9118A, PC-9119A

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor)
	8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors
	8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor
	8485 (Round) - 5 Conductor
	8488 (Round) - 8 Conductor


HV RECT
1G3GT
DO NOT MEASURE
TO CAP OF V11 (HORIZ. OUTPUT)
TO PICTURE TUBE HV ANODE
1Ω
4700Ω
TO TERMINAL 7 OF YOKE SOCKET
TO R53
TO JUNCTION OF R52, C40 & TERMINAL 4 OF YOKE SOCKET
TO JUNCTION OF C41 & PIN 3 OF V12
PART #80-8-3
TO JUNCTION OF R8, R9, & C19
TO PIN 5 OF V5

HORIZ. OUTPUT & HIGH VOLTAGE CIRCUITS USED IN CHASSIS 456.51340, 528.51340, 456.51350 & 528.51350



HORIZ. SWEEP CIRCUIT USED IN CHASSIS 456.51541, 528.51541, 456.51551 & 528.51551

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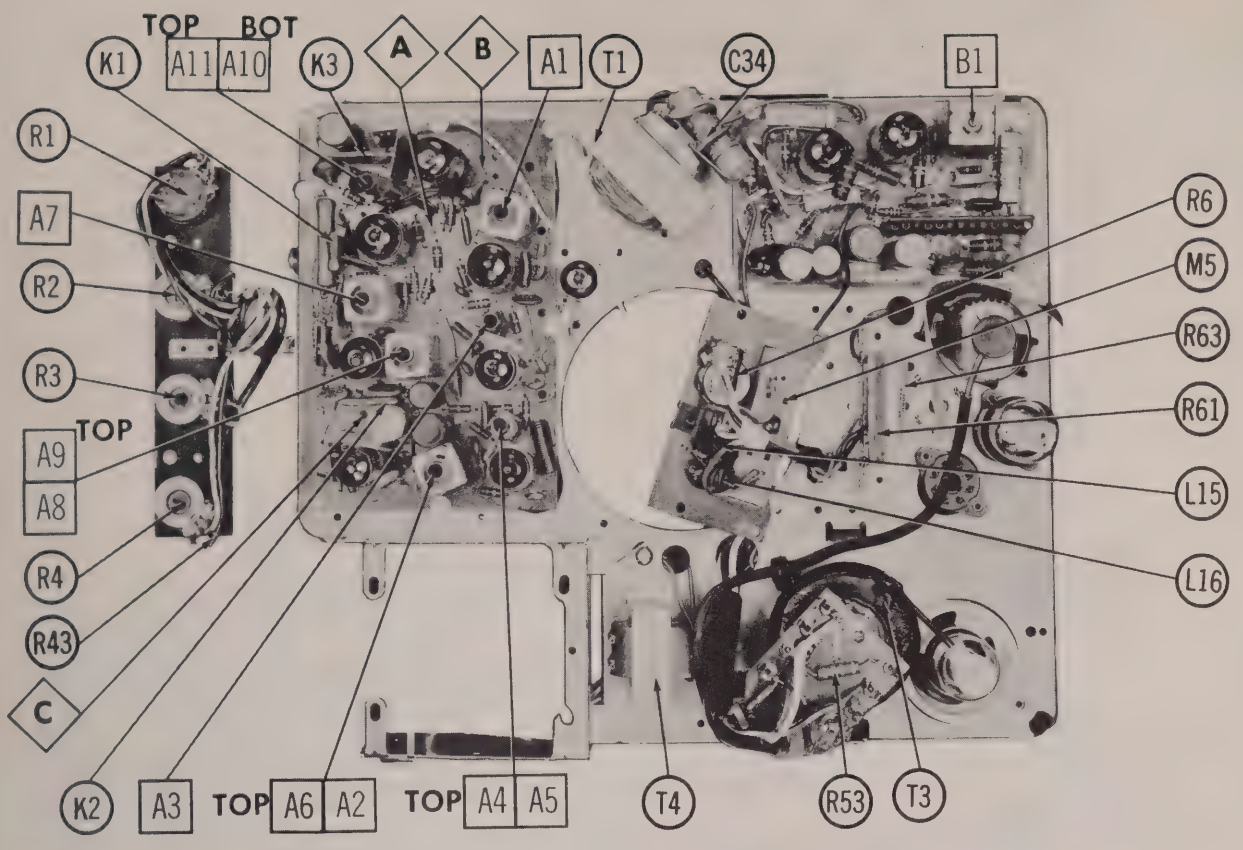
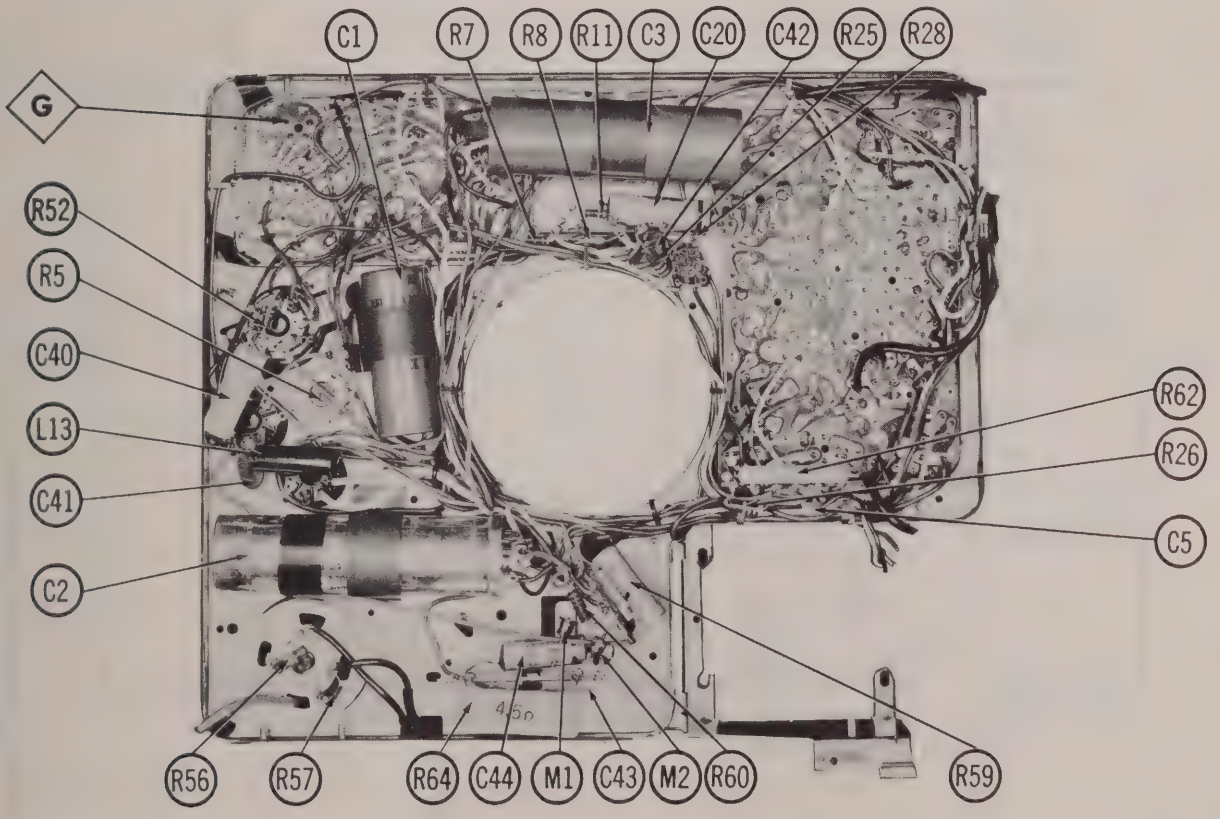
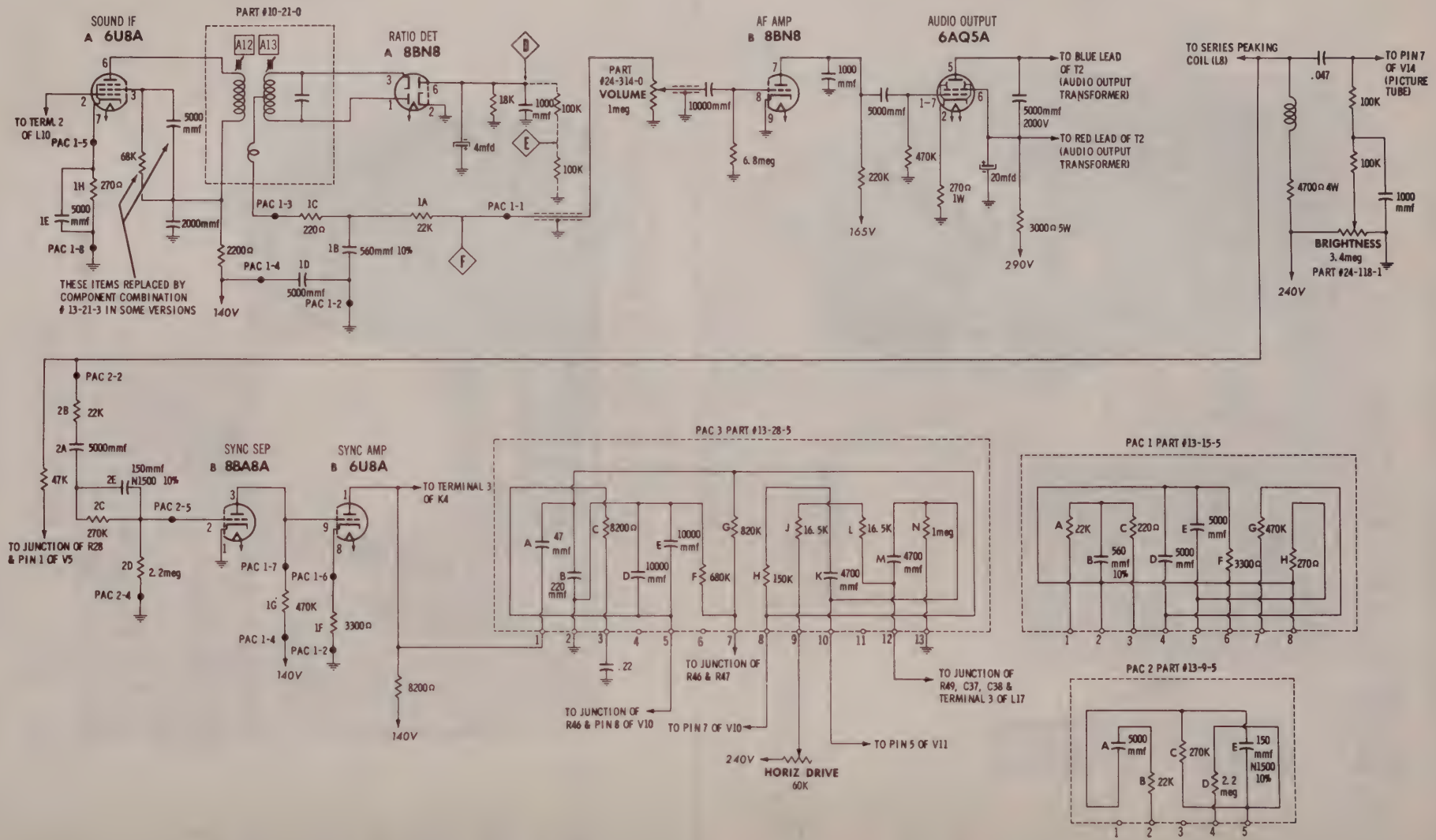
ALTERNATE HORIZONTAL CIRCUITS



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW



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ALTERNATE CIRCUITS CH. 456./528.51340, 350

TUNER PARTS LIST AND DESCRIPTIONS (cont)

95-170-0

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K201	Ant. Isolation	470mmf, .3-1meg	330-1	Centralab Sprague	RC-471 ACI-1
K202	Ant. Isolation	470mmf, .3-1meg	330-1	Centralab Sprague	RC-471 ACI-1

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SILVERTONE PART No.	CBS PART No.	SYLVANIA PART No.	
M201	ST-47 *	1N82A	1N82A	1N82A	UHF Mixer (Clip in) * Some versions may use 1N82A in this application.

TUNER ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VHF OSCILLATOR ALIGNMENT

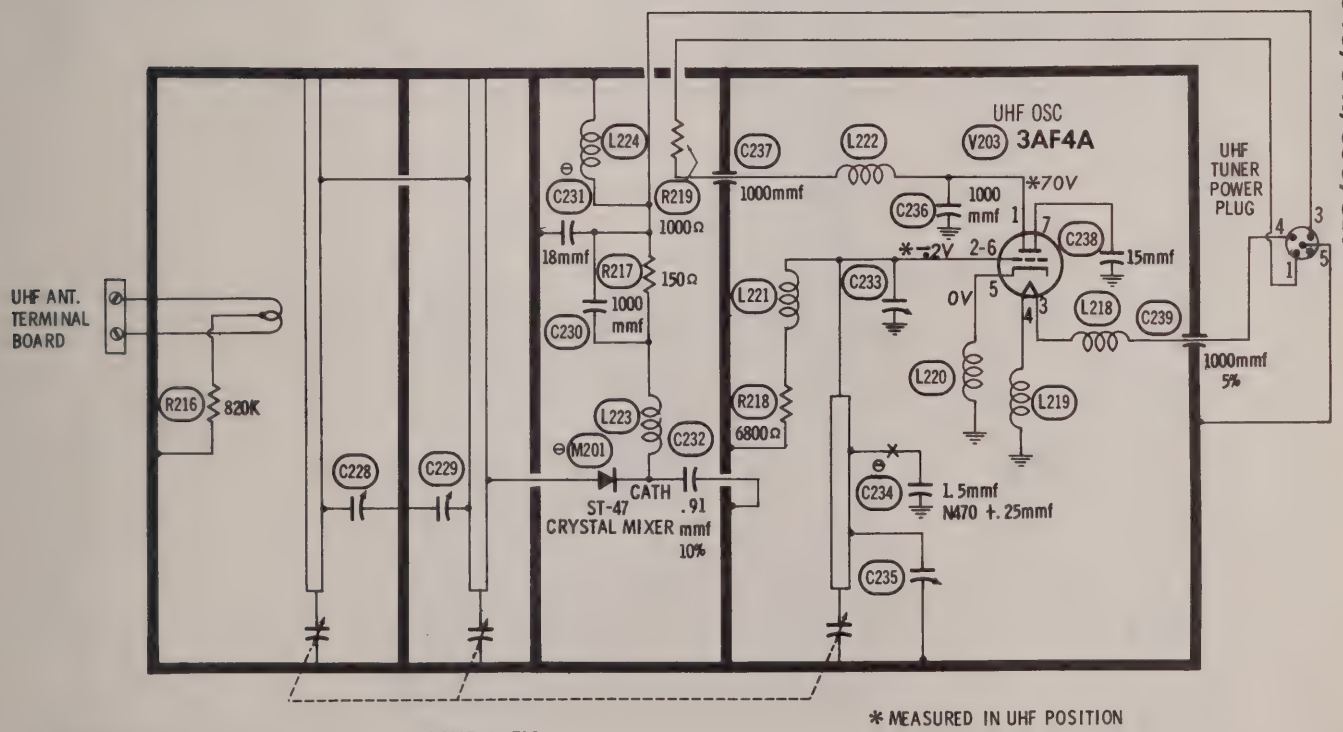
Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest high band channel (13-7) operating in the area. Adjust the high band oscillator adjustment slug (A201) for best picture and sound. Switch Channel Selector to the highest low band channel (6-2) operating in the area and adjust the low band oscillator adjustment (A202) for best picture and sound. Recheck high band adjustment.

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



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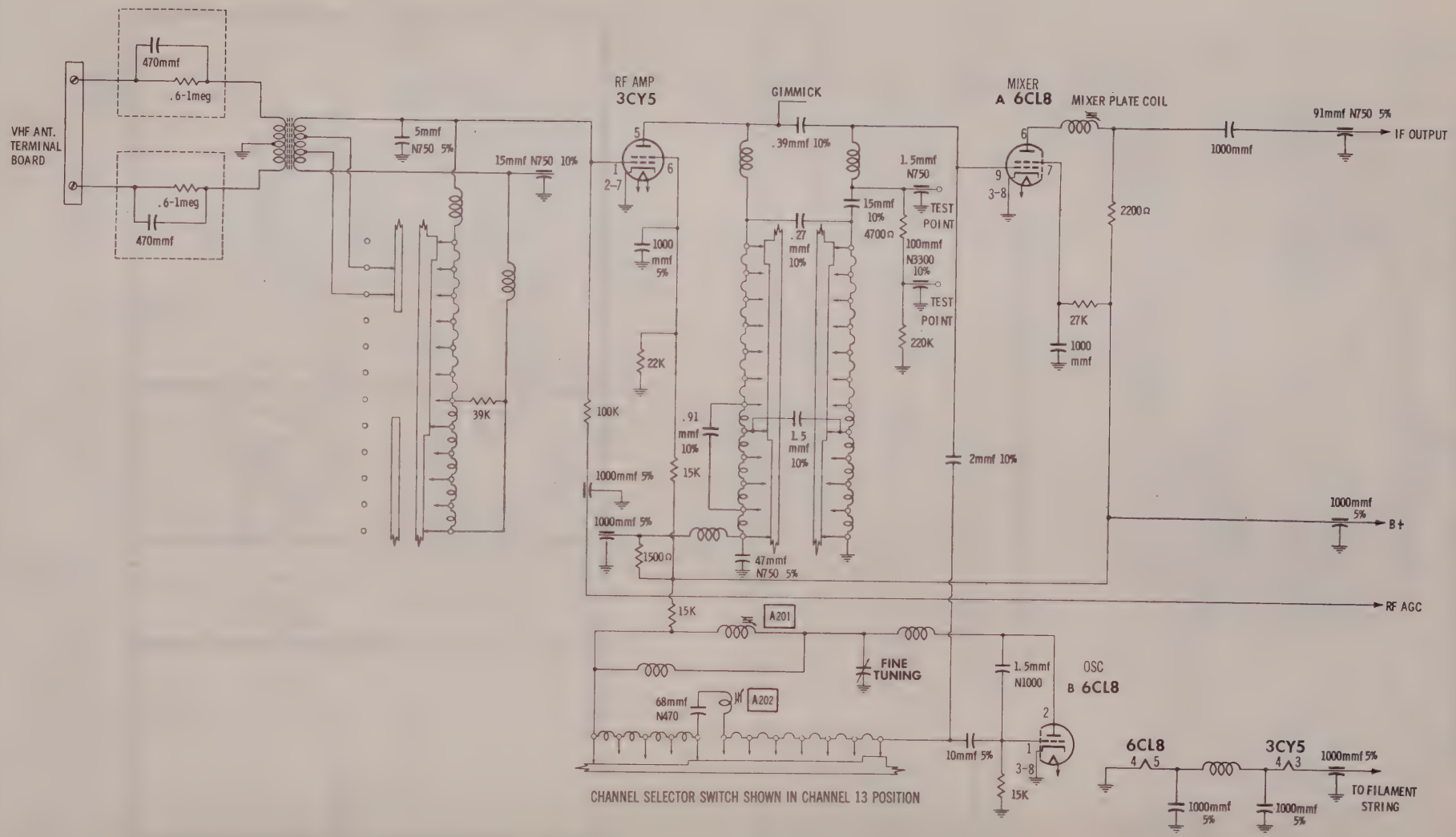
UHF TUNER 95-159-0



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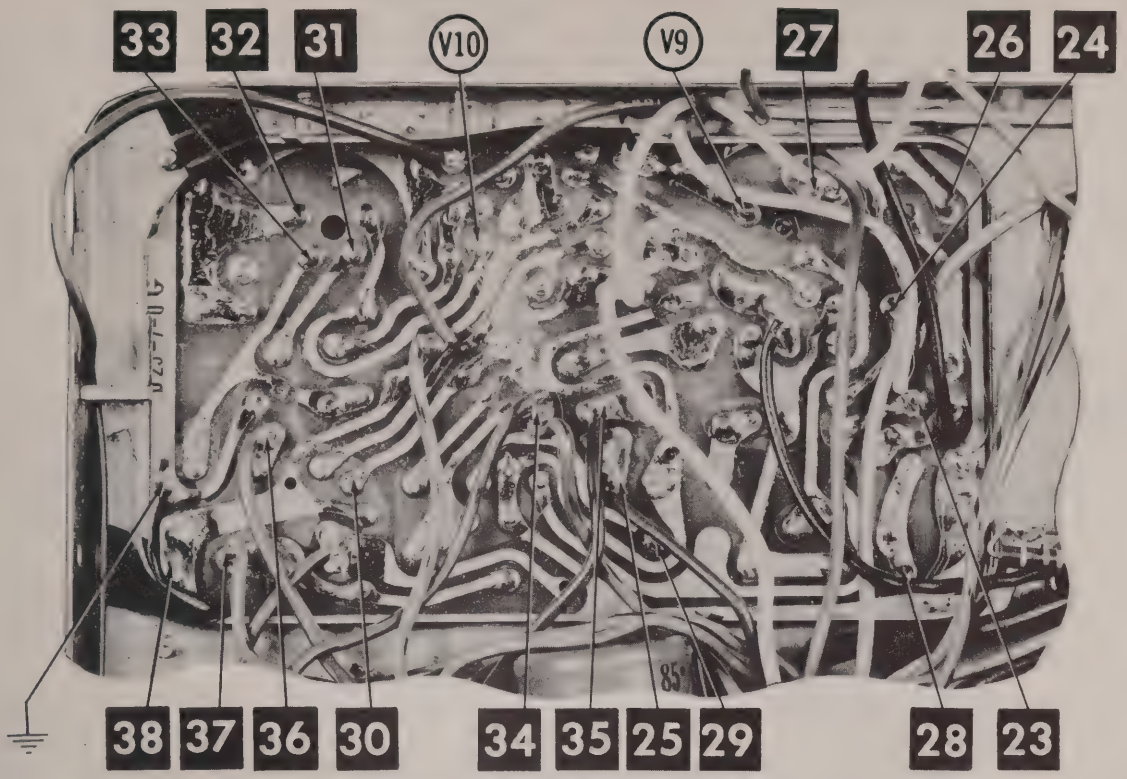
VHF TUNER 95-171-0

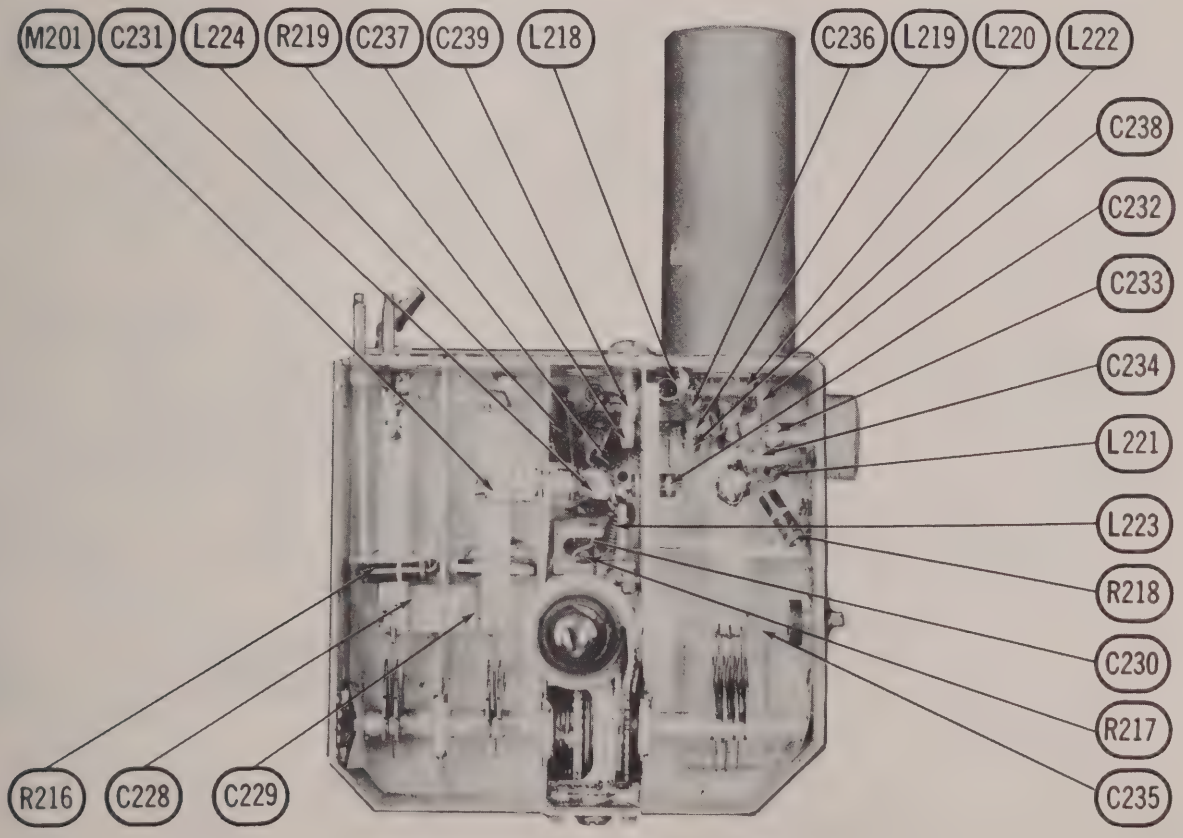
CircuiTrace Numbers 23 thru 38



A Howard W. Sams CIRCUITRACE Photo

SWEEP PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



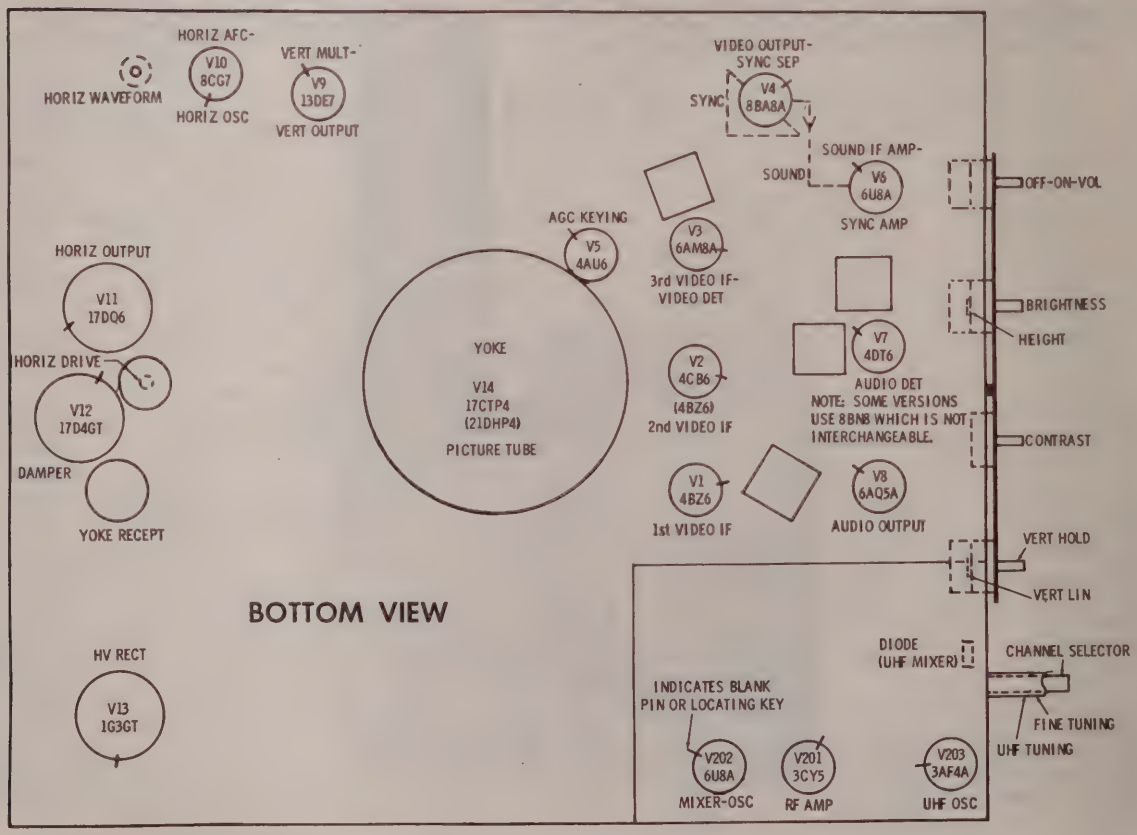
UHF TUNER 95-159-0

RESISTANCE MEASUREMENTS

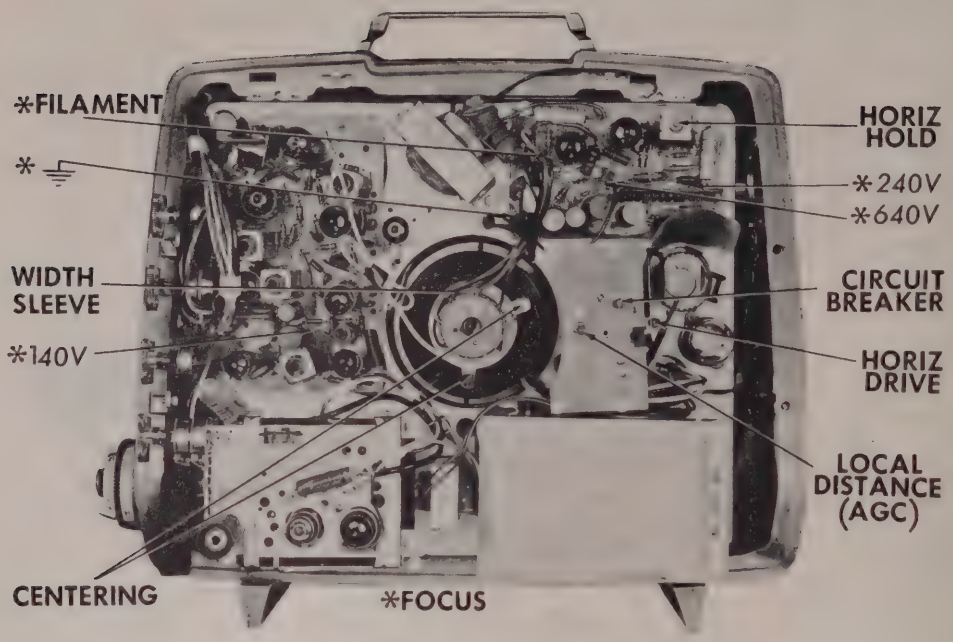
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	62K	56Ω	4.5Ω	5.5Ω	†4000Ω	†4000Ω	0Ω		
V2	4CB6	57K	56Ω	5.5Ω	6.5Ω	†4000Ω	†4000Ω	0Ω		
V3	6AM8A	220Ω	.1Ω	†3500Ω	6.5Ω	7.5Ω	†3500Ω	.1Ω	4700Ω	0Ω
V4	6BA8A	0Ω	2.2meg	†470K	9Ω	7.5Ω	● 40Ω	4700Ω	†4700Ω	†4800Ω
V5	4AU6	†35K	†800Ω	3.5Ω	4.5Ω	270K	†47K	†800Ω		
V6	6U8A	†11K	4Ω	†70K	9Ω	10Ω	†4700Ω	220Ω	3300Ω	†470K
V7	4DT6	5.2Ω	680Ω	10Ω	11Ω	†490K	†23K	560K		
V8	6AQ5A	0Ω	220Ω	11Ω	12Ω	†3200Ω	†3000Ω	0Ω		
V9	13DE7	†490Ω	1meg	1meg	16Ω	14Ω	● †1.6meg	● 1.4meg	0Ω	● 1000Ω
V10	8CG7	†50K	830K	0Ω	17.5Ω	16Ω	†800Ω	1.5meg	760K	NC
V11	17DQ6	TP	20Ω	TP	†9000Ω	1meg	NC	22Ω	0Ω	TOP CAP †9Ω
V12	17D4GT	NC	NC	¶200K	NC	†120Ω	TP	17.5Ω	20Ω	
V13	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †430Ω
V14	17CTP4	12Ω	56K	†22K	†22K	NC	NC	● 850K	14Ω	
V201	3CY5	1meg	0Ω	1Ω	2Ω	†4000Ω	†15K	0Ω		
V202	6U8A	†4700Ω	270K	†35K	2Ω	3.5Ω	†4700Ω	0Ω	0Ω	15K
V203	3AF4A	†*5700Ω	*6800Ω	1Ω	0Ω	*0Ω	*6800Ω	†*5700Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
■ THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
• MEASURED IN "UHF" POSITION.
† MEASURED FROM 290V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station and adjust the Horizontal Hold until picture synchronizes horizontally. If the picture cannot be synced with the Horizontal Hold, turn the Waveform slug (B1) several turns out of the coil form from its original position. Readjust the Horizontal Hold until the picture synchronizes horizontally.

Connect the vertical amplifier of a scope thru a low capacity probe to point ⊕. Connect low side to chassis. Retouch the Horizontal Hold to synchronize the picture.

Adjust the Waveform slug (B1) for a waveform similar to Fig. 2 with the sharp peak approximately 10% higher than the borad peak. Keep the picture in sync during this adjustment with the Horizontal Hold. Remove scope connection and retouch Horizontal Hold if necessary to synchronize picture horizontally.

Turn Horizontal Drive (R5) clockwise until drive lines appear. Then turn counterclockwise until drive lines just disappear.

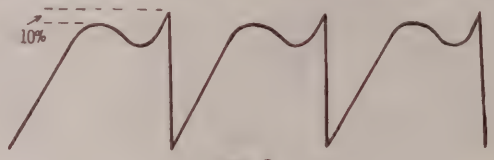
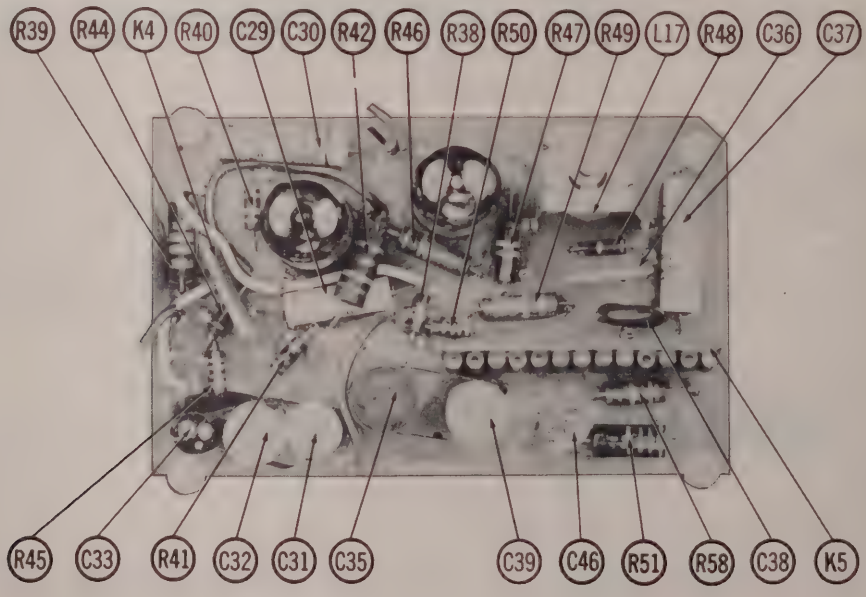


FIG. 2



SWEEP PRINTED BOARD

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PRODUCTION CHANGE BULLETIN 218

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 5 IN SET 371

Motorola Models Y21CT2B, Y21CT2M (Ch. TS-905Y), 21CT2B, 21CT2M (Ch. TS-905) were run in PHOTOFACT Folder 5 — Set 371.

Models 21CK3 (Ch. TS-905) and 21CT2 (Ch. WTS-905) are electrically identical, except for the following changes.

TS-905-B-00

COMPONENT CHANGES

C113 is decreased from 180mmf to 130mmf.

C118 voltage rating increased to 1400V.

L47 part number is changed to #24K791446.

A 56Ω, 5W resistor and a 10mmf @ 16V (wired in parallel) are added between the junction of T8 (Horizontal Isolation Choke) and terminal 4 of M9 (Width Switch).

R142 is increased from 56K to 2.2meg.

R14 (High Voltage Adjustment shaft is shortened.

L20 (Shunt Peaking coil) is increased from 80 microhenries to 180 microhenries.

L22 (Series Peaking coil) is changed to 180 microhenries wound on a 10K resistor.

A 180 microhenries coil in series with a 1800Ω resistor is added between grid and junction of M8 (Delay Line) and L22.

A 4700Ω resistor is added from junction of M8 (Delay Line) and L22 to ground.

R66 is omitted.

C55 is omitted.

R67 is decreased from 22K to 12K.

R68 is decreased from 3900Ω to 3300Ω.

A 560Ω resistor is added between L25 and L24.

Pin 4 of V30 (Pic Tube) is connected directly to junction of L24 and R67.

Pins 5 and 13 are disconnected from pin 4 of V30 and reconnected to junction of L25 and 560Ω resistor.

R174 is increased from 330K to 390K.

L31 is changed to Part #24K743308.

L32 is changed to Part #24K743309.

L39 is changed to Part #24K743310.

C124 is decreased from 10mmf to 6.8mmf.

R148 is increased from 10K to 15K.

A .01 capacitor is added from pin 6 of V22A (Chroma Bandpass amp.) to ground.

C83, .005mfd capacitor, is changed to a disc type capacitor to minimize lead length.

R122 is decreased from 150K to 100K.

R100 is increased from 6800Ω to 12K.

R101 is decreased from 3300Ω to 1500Ω.

A 470mmf capacitor is added across R101.

A 3900Ω resistor is added between pin 8 of V23A (Burst Amp.) and junction of R190, R189 and C144.

MOTOROLA MODELS 21CK3 (Ch. TS-905), 21CT2 (Ch. WTS-905)

Continued on Reverse Side

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

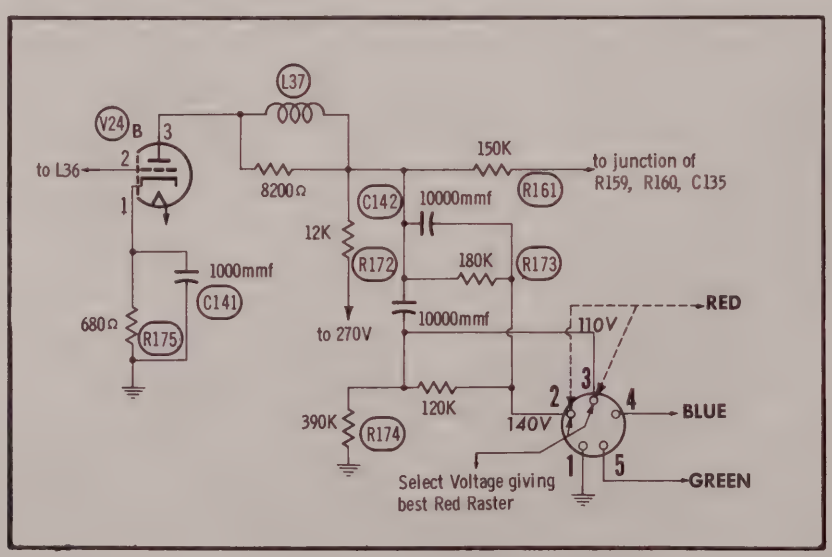
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PRODUCTION CHANGE BULLETIN 218

PRODUCTION CHANGE BULLETIN 218

SET 440 FOLDER 3

	A shielded lead is added between junction of 3900Ω resistor added, and junction of R190, R189, and C144. R107 is decreased from 2.2meg to 1.5meg. R115 is increased from 33K to 39K. R109 is decreased from 2.2meg to 1meg. A .25mfd capacitor is added from junction of L49 (Filter choke) and C1B to ground to reduce radiation. L29 (Ratio Detector) is changed to Part #24B742247. R84 is decreased from 180Ω to 100Ω. C70, 90mmf capacitor contained in L29, is removed and connected externally across terminals 1 and 2 of L29. C75 is changed from 470mmf to .001mfd. A 470mmf capacitor is added from pin 6 of V12A (Ratio Det.) to ground.
TS-905B Conv.	BLUE HORIZONTAL DYNAMIC CONVERGENCE CHANGE Temperature rating of C97 is increased.
PS-905C	ELECTROLYTIC CHANGE Voltage rating of C1A and B1B is increased from 450V to 475V.
TS-905 B-01	TUNER OSCILLATOR CHANGE A special cement is used to secure the oscillator coils in the tuner. Tuners are changed to Part #VTT-83C and VTT-83CY.
TS-905 B-02	ELECTROLYTIC CHANGE 10mfd capacitor added between junction of T8 and terminal 4 of M9 is increased to 100mfd
TS-905 B-03	HORIZONTAL CENTERING CHANGES A .5mfd capacitor is added across the 56Ω resistor from junction of T8 (Horizontal Isolation Choke) and terminal 4 of M9 (Deflection yoke). C13 is increased from 10mfd to 100mfd. R111, R92 and C8 are relocated for better heat distribution.
TS-905 B-04	RED FIELD IMPROVEMENT R173 is decreased from 270K to 180K and relocated. A 120K resistor is added at junction of R173 and terminal of test receptacle. A .01mfd capacitor is added between junction of R172 and L37 and terminal of test receptacle. R174 is disconnected from junction of R173 and terminal of test receptacle and reconnected to 120K resistor. A partial schematic showing wiring changes and components added to the test receptacle circuits are given in this bulletin.



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 430

HOFFMAN CHASSIS 339 341, AP-415, RP-409

Hoffman Models B1311, B3501, B3511, B3521, B3531, K1311, K3531, M1311, M3501, M3511, M3521, M3531, SP3501, SP3531, W3501, W3511, W3521, W3531 (Ch. 339, 341, AP-415, RP-409) were covered in PHOTOFACT Folder 1 — Set 430.

The replacement data for the audio output transformer was omitted. A chart showing the replacement data for T6, audio output transformer is given below.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	7500Ω	3-4Ω	5160A	Z1115	A-2931	AU-602 ①	A-3878	24S52	S-8X	① Drill new mounting hole.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 430

PACKARD-BELL CHASSIS V8-4,

Packard-Bell Models 17VT7, 21VT5 (Ch. V8-4, RM-200, RM-201) were covered in PHOTOFACT Folder 2 — Set 430.

The replacement data for the audio output transformer was omitted. A chart showing the replacement data for T6, audio output transformer is given below.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	4500Ω	3-4Ω	89436-C	Z1107	A-2930	AU-601	A-3877	24S51	S-3X	

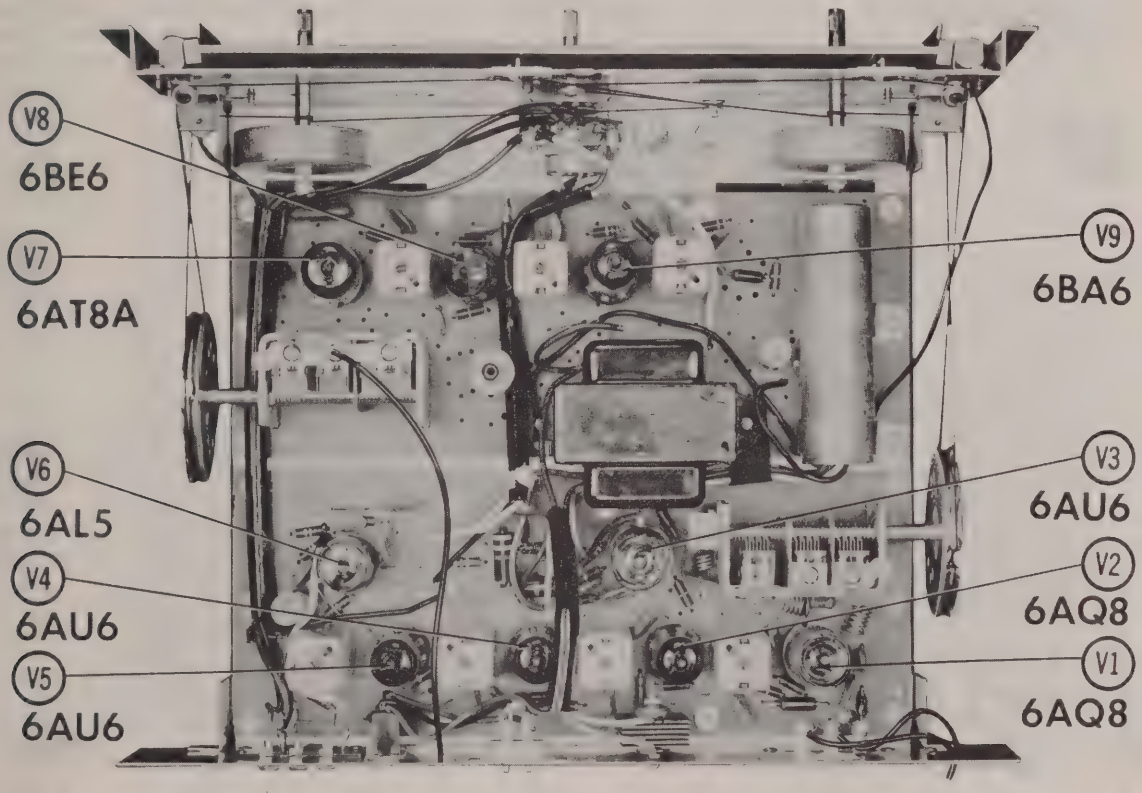
PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

HARMAN-KARDON MODEL T-224

HARMAN-KARDON
MODEL T-224

TRADE NAME	Harman-Kardon Model T-224 "The Duet"		
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L. I., N. Y.		
TYPE SET	AC Operated FM-AM Tuner		
TUBES	Nine		
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles	RATING	38 Watts, .40 Amp@117 Volts AC
TUNING RANGE-BROADCAST	535-1650KC	FREQ. MOD.	88-108MC



HARMAN-KARDON
MODEL T-224

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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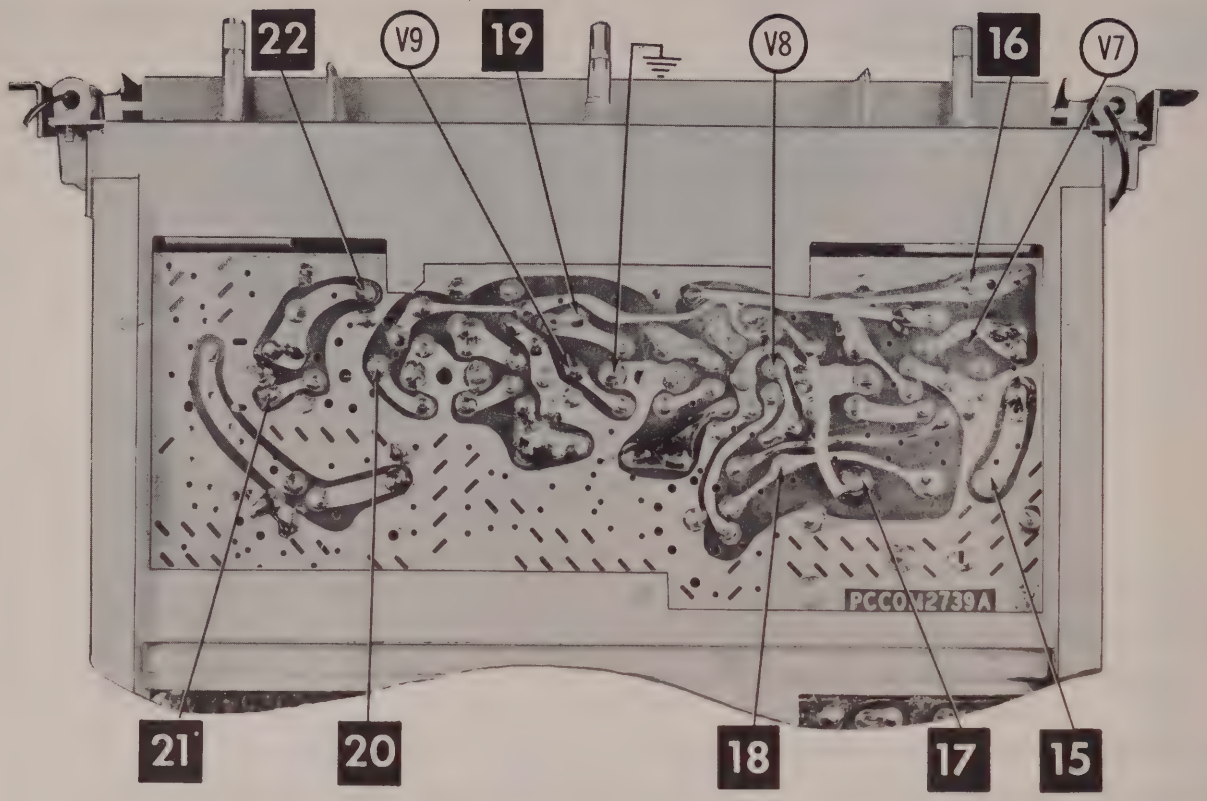
H889

DATE 5-59

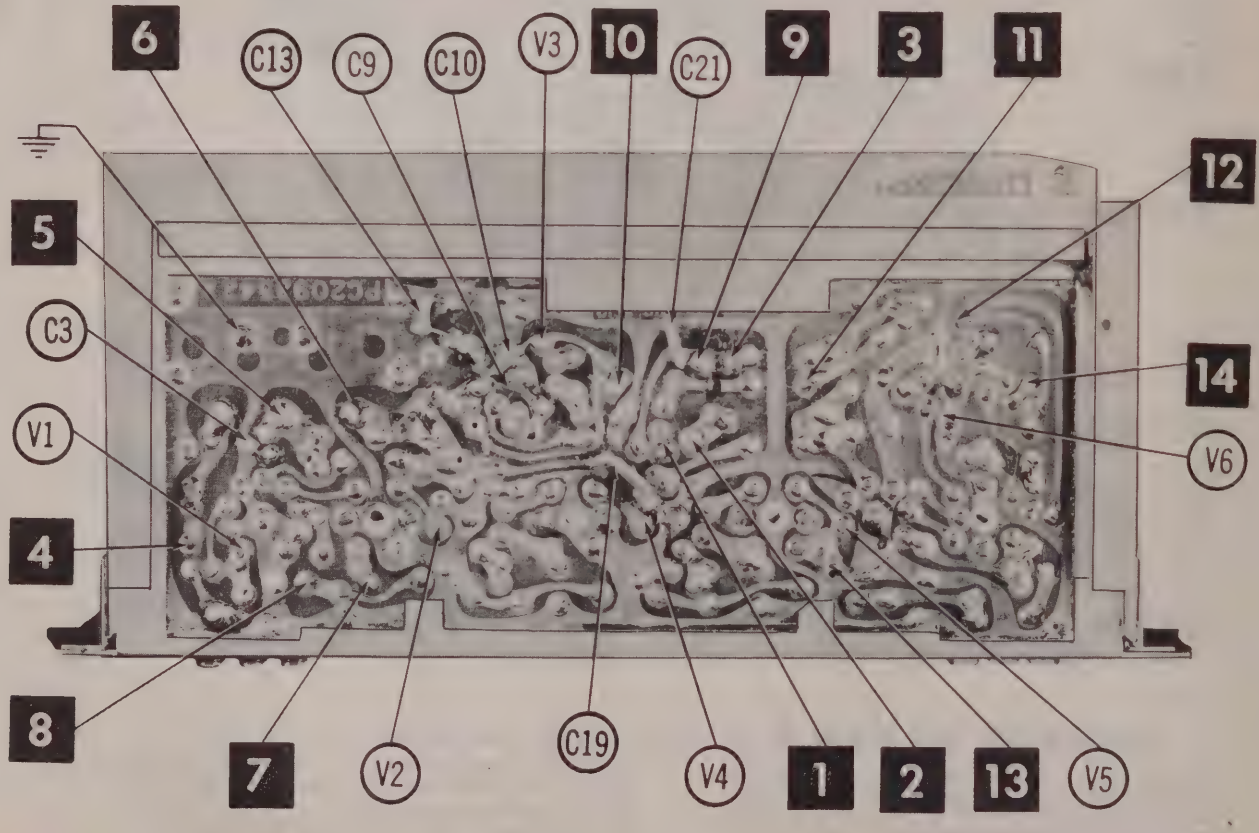
SET 440 FOLDER 4



A Howard W. Sams CIRCUITRACE® Photo

AM PRINTED BOARD

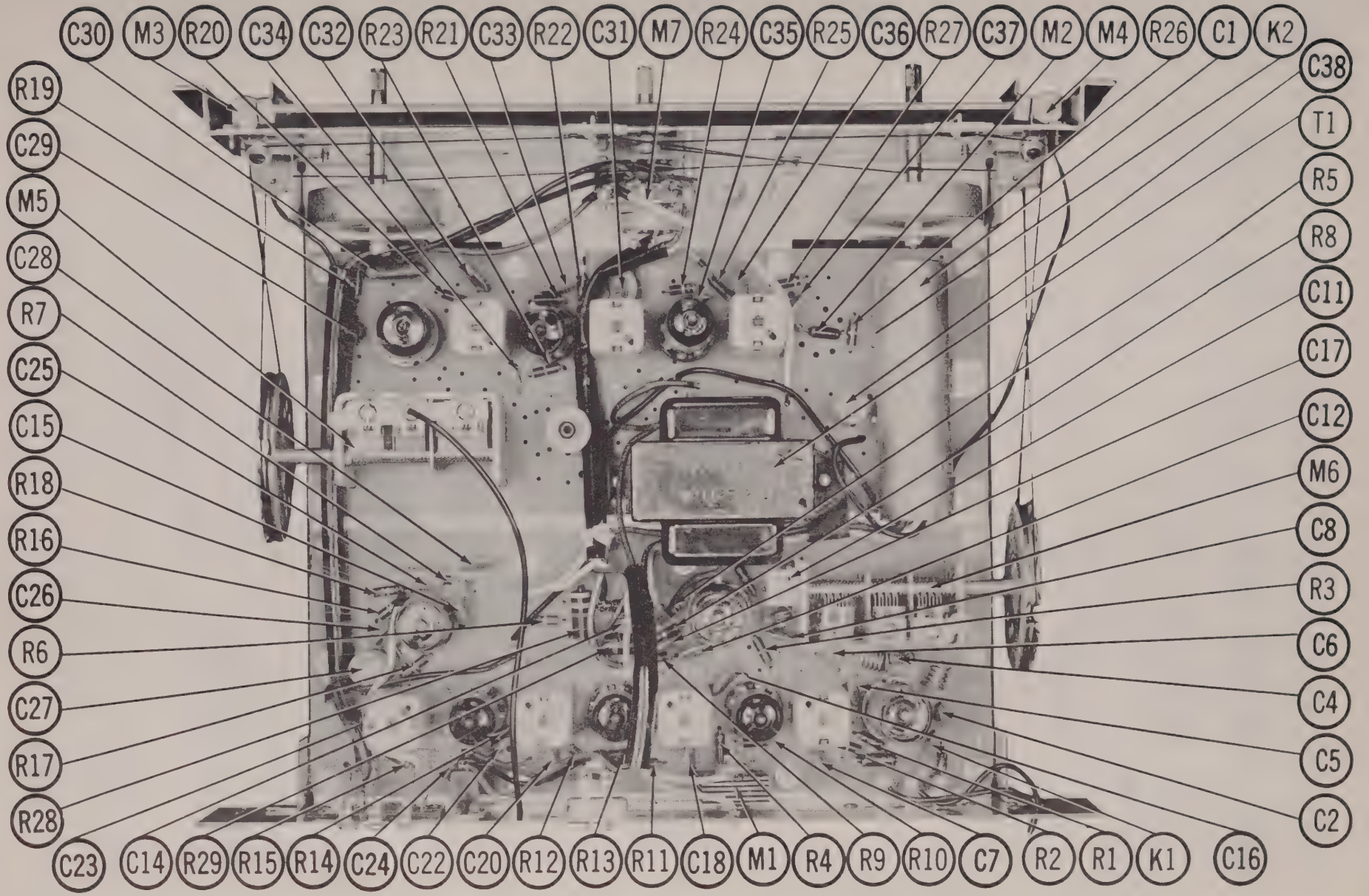
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



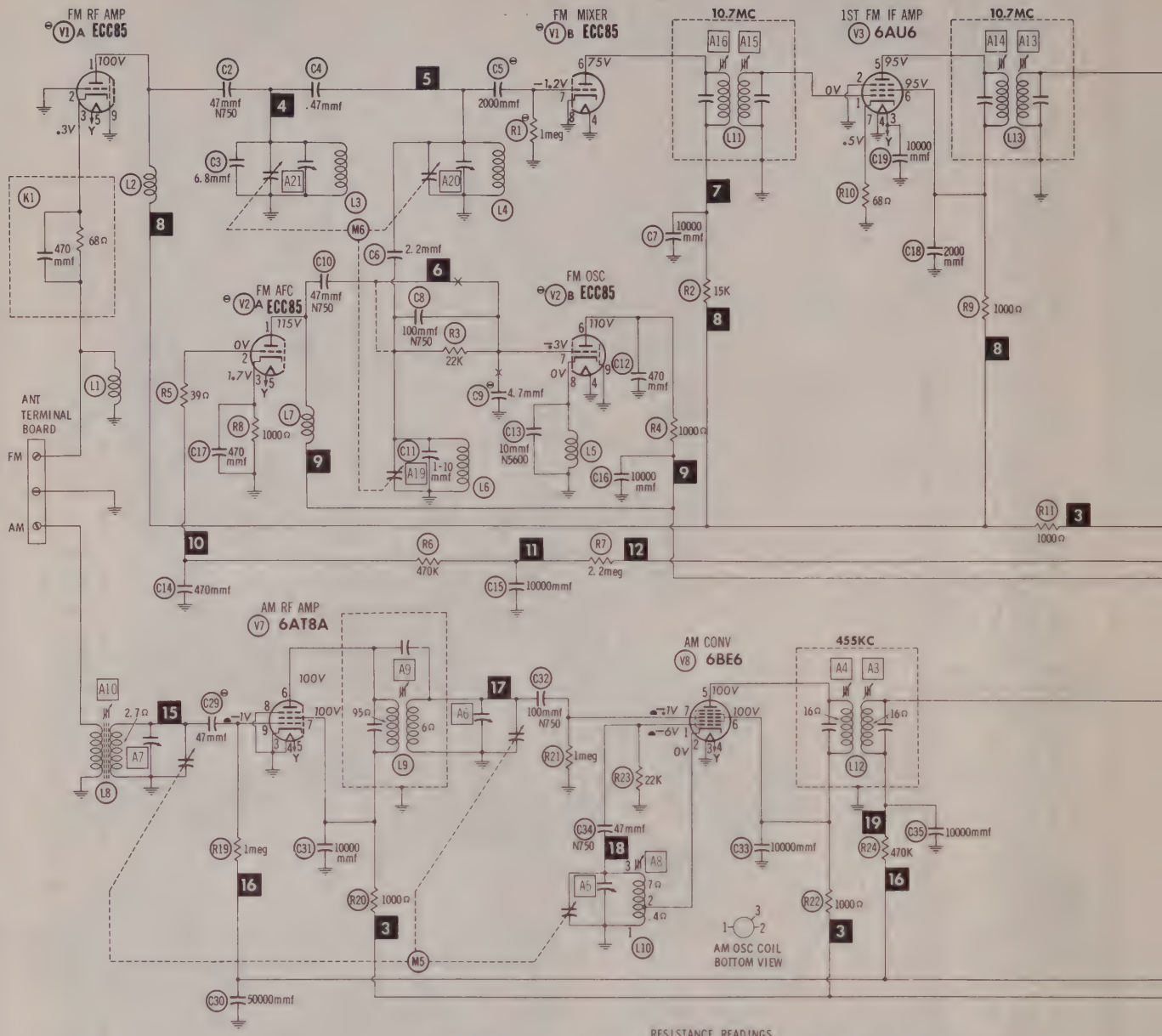
A Howard W. Sams CIRCUITRACE® Photo

FM PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CHASSIS TOP VIEW - CAPACITOR, RESISTOR, & MISC IDENT



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	†1700Ω	0Ω	68Ω	0Ω	.1Ω	†16K	1meg	0Ω	0Ω
V2	ECC85 6AQ8	†1700Ω	3meg	1000Ω	0Ω	.1Ω	†1600Ω	22K	.1Ω	0Ω
V3	6AU6	.6Ω	0Ω	.1Ω	0Ω	†2700Ω	†2700Ω	68Ω		
V4	6AU6	.6Ω	0Ω	.1Ω	0Ω	†1700Ω	†1700Ω	68Ω		
V5	6AU6	100K	0Ω	.1Ω	0Ω	†7400Ω	†7400Ω	0Ω		
V6	6AL5	0Ω	180K	.1Ω	0Ω	360K	0Ω	180K		
V7	6AT8A	NC	NC	0Ω	0Ω	.1Ω	▬ †1700Ω	▬ †1700Ω	0Ω	▬ 4.5meg
V8	6BE6	22K	.4Ω	0Ω	.1Ω	†▬1700Ω	†▬1700Ω	1meg		
V9	6BA6	3.8meg	0Ω	0Ω	.1Ω	†▬1700Ω	†▬1700Ω	0Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1.
▬ MEASURED IN "AM" POSITION.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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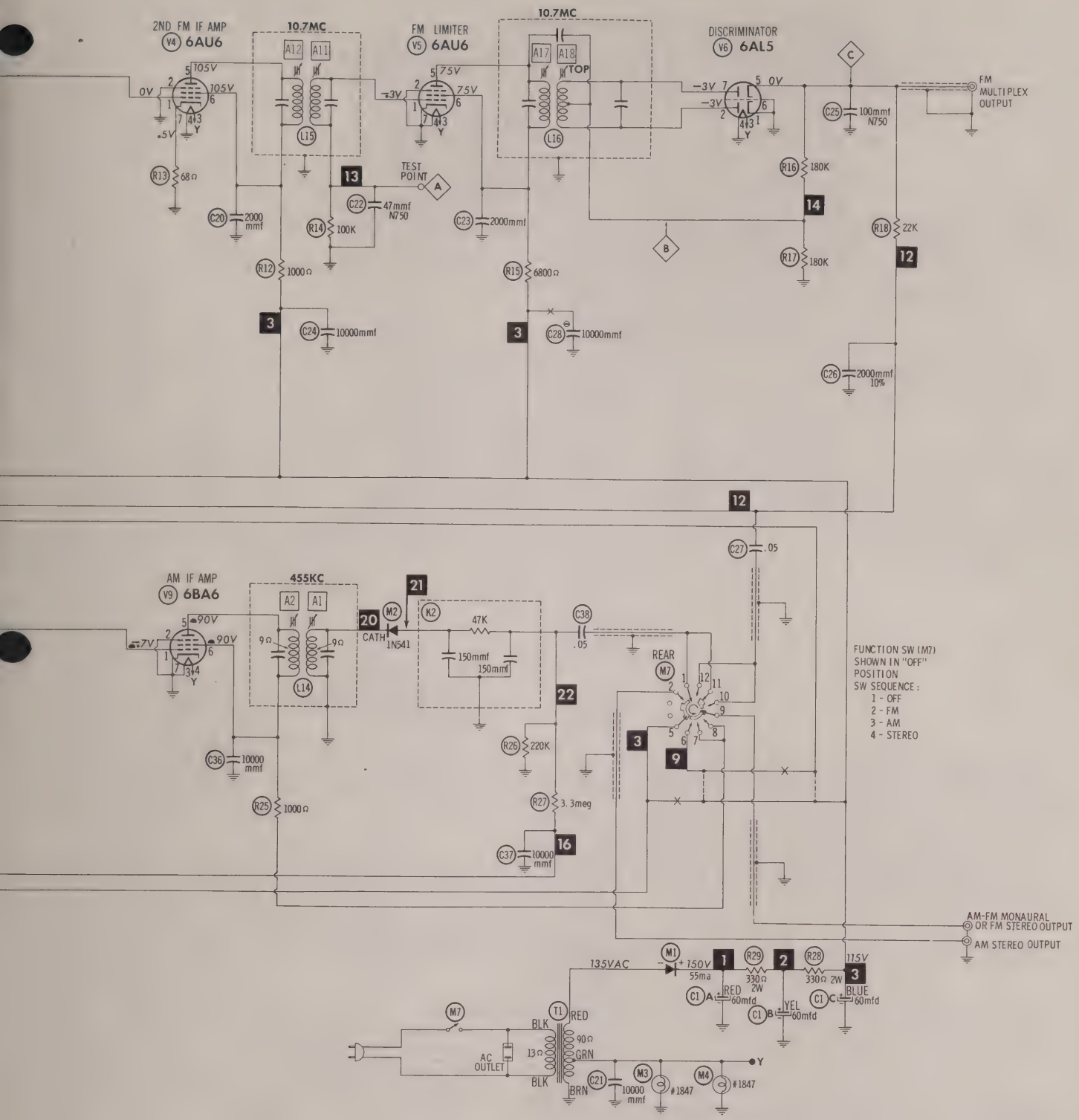


HARMAN-KARDON
MODEL T-224

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3, A4, A10, A11, A12, A13, A14, A15, A16, A17.....GENERAL CEMENT #5097, 8727
WALSCO #2515

A8.....GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

A5, A6, A7, A18, A19, A20.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to AM RF stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	AC probe to AM-FM monaural jack. Common to chassis.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9, A10	Repeat Steps 2 & 3.

FM IF ALIGNMENT, USING AM SIGNAL GENERATOR & VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	200mmf	High side to FM RF stator lug of tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A17	"
6.	"	"	"	"	"	DC probe thru 1meg to point (C). Common to chassis.	A18	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

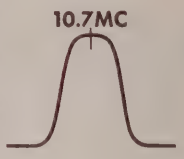


FIG. 1

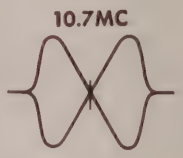


FIG. 2

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	200mmf	High side to FM RF stator lug of tuning gang. Low side to chassis.	10.7MC (450KC SWP)	FM	Point of non-interference	Vert amp to point (A). Low side to chassis.	A11, A12, A13, A14, A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert amp thru 27K to point (B). Low side to chassis.	A17	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	"	"	"	"	Vert amp to point (C). Low side to chassis.	A18	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A17 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side to FM antenna terminal. Low side to chassis.	106MC (Unmod.)	FM	106MC	DC probe to point (A). Common to chassis.	A19, A20, A21	Adjust for maximum output.
8.	"	"	90MC	"	90MC	"	L6, L4, L3	Adjust for maximum output by compressing or expanding coil turns. Repeat Steps 7 & 8.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	ECC85/6AQ8
V2	FM Osc. -AFC	ECC85/6AQ8
V3	1st FM IF Amplifier	6AU6
V4	2nd FM IF Amplifier	6AU6
V5	FM Limiter	6AU6

ITEM No.	USE	TYPE
V6	Discriminator	6AL5
V7	AM RF Amplifier	6AT8A
V8	AM Converter	6BE6
V9	AM IF Amplifier	6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	200	JE2352713	PR3-020	C0234			Q-011.1	TVAS-3470*
B	60	200						MT-3560	
C	60	200							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

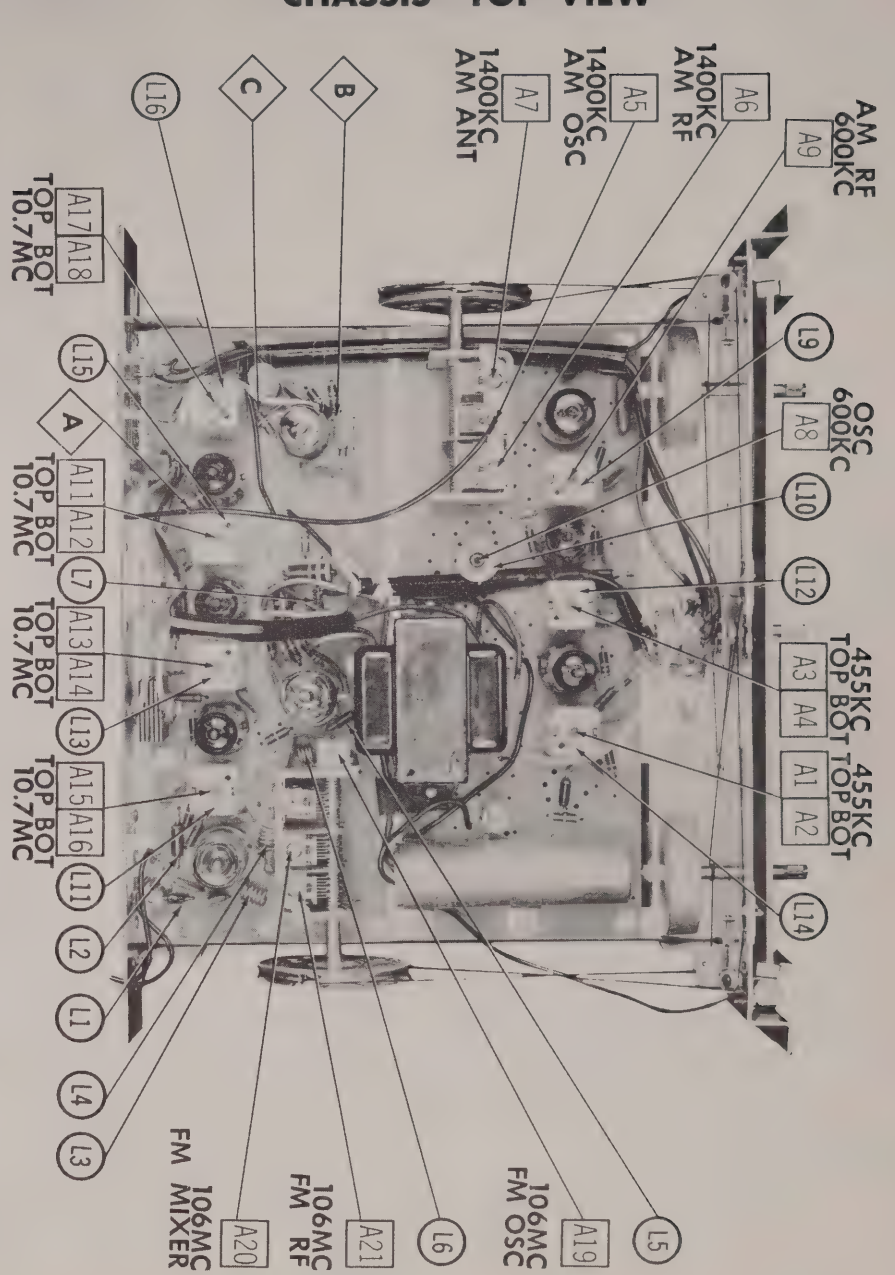
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	47			N750-DI47	DTN-47	CTA6Q47U	CN7-447	5TCU-Q47	N750
C3	6.8			NPO-SI6.8	TCZ-6R8	CT6V68C	ZT-5568	5TCCB-V68	
C4	.47								
C5	2000			BPD-002	DD-202	BYA10D2	B-220	5HK-D2	①
C6	2.2			NPO-SI2.2	TCZ-2R2	CT6V22C		5TCCB-V22	
C7	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	100			N750-DI100	DTN-100	CTA6T1U	CN7-310	5TCU-T1	N750
C9	4.7			NPO-DI4.7	DTZ-4R7	C10V47C	CN0-547	5TCCB-V47	②
C10	47			N750-DI47	DTN-47	CTA6Q47U	CN7-447	5TCU-Q47	N750
C11	1-10		JV20688						
C12	470			BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C13	10								N5600
C14	470			BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C15	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C16	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C17	470			BPD-00047	DD-471	L10T47	B-347	5GA-T47	
C18	2000			BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C19	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C20	2000			BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C21	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C22	47			N750-DI47	DTN-47	CTA6Q47U	CN7-447	5TCU-Q47	N750
C23	2000			BPD-002	DD-202	BYA10D2	B-220	5HK-D2	
C24	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	100			N750-DI100	DTN-100	CTA6T1U	CN7-310	5TCU-T1	N750
C26	2000						JL-220		10%
C27	.05	200		P288N-05	DF-503	BC2S47J	ACE615	2SE-S47	
C28	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	②
C29	47			BPD-000047	DD-470	L10Q47	CN0-447	5GA-Q47	③
C30	50000				DF-503			5HK-S5	
C31	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C32	100			N750-DI100	DTN-100	CTA6T1U	CN7-310	5TCU-T1	N750
C33	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	47			N750-DI47	DTN-47	CTA6Q47U	CN7-447	5TCU-Q47	N750
C35	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C36	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C37	10000			BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C38	.05	200		P288N-05	DF-503	BC2S47J	ACE615	2SE-S47	

① Some versions may use 10000mmf in this application.
② May not be used in some versions.
③ Some versions may use 100mmf in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Harman-Kardon PART No.	NOTES
R1	1meg			Note 1
R2	15K			
R3	22K			
R4	1000Ω			
R5	39Ω			
R6	470K			
R7	2.2meg			
R8	1000Ω			
R9	1000Ω			
R10	68Ω			
R11	1000Ω			
R12	1000Ω			
R13	68Ω			
R14	100K			
R15	6800Ω			
R16	180K			
R17	180K			
R18	22K			
R19	1meg			
R20	1000Ω			
R21	1meg			
R22	1000Ω			
R23	22K			
R24	470K			
R25	1000Ω			
R26	220K			
R27	3.3meg			
R28	330Ω	2		
R29	330Ω	2		

Note 1. Some versions may use 3.3meg in this application.

COILS (RF-IF)

ITEM No.	USE	Harman-Kardon PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil				4584		.24 Microhenry
L2	RF Choke						3.3 Microhenries
L3	FM RF Coil						
L4	FM Mixer Coil						
L5	Cathode Choke						1 Microhenry
L6	FM Osc. Coil						
L7	RF Choke						3.3 Microhenries
L8	Loopstick	GL2352740					Note 1
L9	AM RF Coil	GTC0M2751					
L10	AM Osc. Coil	GLC0M2738					
L11	1st FM IF Trans.	GT2092595	16-3490		1463-PC		
L12	1st AM IF Trans.	GTC0M2752	16-6780	BC-356	13-PC1	RF-4	
L13	2nd FM IF Trans.	GT2092596	16-3490		1463-PC		
L14	2nd AM IF Trans.	GTC0M2753	16-6780	BC-357	13-PC2	RF-4	
L15	3rd FM IF Trans.	GT2092597	16-3490		1463-PC		
L16	Discriminator	GT2092598					

Note 1. Tuning ring Part #P481329.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .40A	135V @ .40A Tap @ 6.3V @ 3.3A		FT2352712						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	Ant. Coupling	470mmf, 68Ω	STC0M2553	
K2	Diode Filter	150mmf, 150mmf, 47K	PC781599	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 111TM2 Sprague D-2

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.056A	Z1122134	1234AH	T075 SD-94 ①	75 K200 ①	① Silicon Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Harman-Kardon PART No.	REPLACEMENT DATA CBS PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M2	1N541 *		1N636	1N295	AM Detector (Pigtail)

* Some versions may use 1N542 in this application (Part #GC1041698).

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M3	Lamp		#1847
M4	Lamp		#1847
M5	Tuning Cap.	JV2352725	AM, 3 Section
M6	Tuning Cap.	JV2092541	FM, 3 Section
M7	Switch	ER2352693	Function (4 Position, Rotary, Wafer, Snap Type)
	Printed Board	PCC0M2739A	AM
	Printed Board	PC2092542A	FM

CABINETS & CABINET PARTS

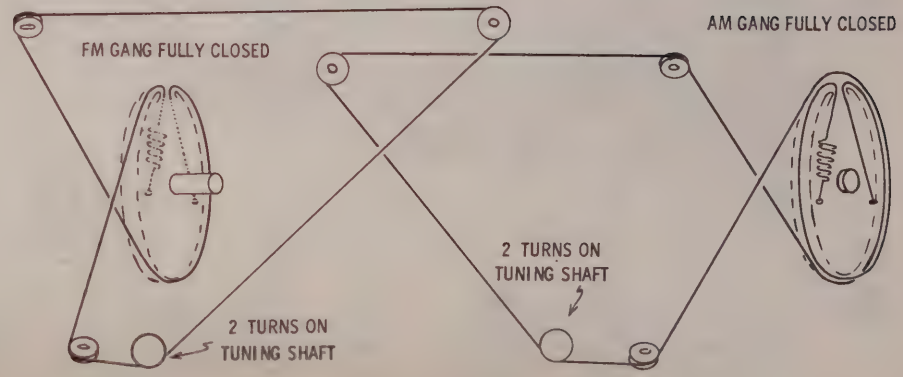
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	PC0M2840	3 Used
Dial Glass	P2352742	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874



DIAL CORD STRINGING

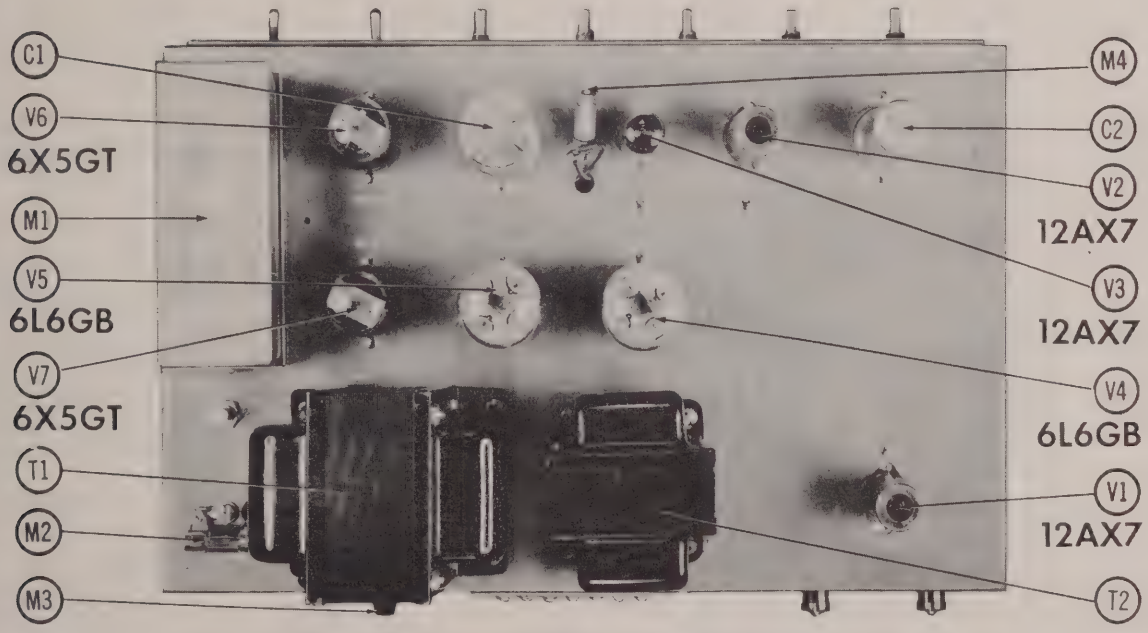
PHOTOFACT* Folder

LAFAYETTE
MODEL PA-64

LAFAYETTE
MODEL PA-64

TRADE NAME	Lafayette Model PA64		
SUPPLIER	Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.		
TYPE SET	Battery Operated 7 Tube, Four Channel Audio Amplifier		
POWER SUPPLY	6 (Or) 12 Volt Storage Battery 117 Volts AC, 60 Cycles	RATING	12 Amp. @6.3 Volts DC (Or) 9 Amp. @12.6 Volts DC 120 Watts, .980 Amp. @117 Volts AC

LAFAYETTE
MODEL PA-64



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H947

SET 440 FOLDER 5

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	
V2	AF Amplifier	12AX7	
V3	AF Amp. -Phase Inv.	12AX7	
V4	Output	6L6GB	
V5	Output	6L6GB	
V6	Rectifier	6X5GT	
V7	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Lafayette PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH3-50-05	C0372	FP396.1	TMQ-12	TVL-3842	
B	■20	450							
C	▲20	450		AFH3-156	C1120	FP387.1	TMT-155	TVL-3816.4	
C2A	■10	300							
B	▲10	250							
C	100	15		PRS50V20	BBR20-25	TT25X20	TD-20-150	TVA-1410	
C3	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

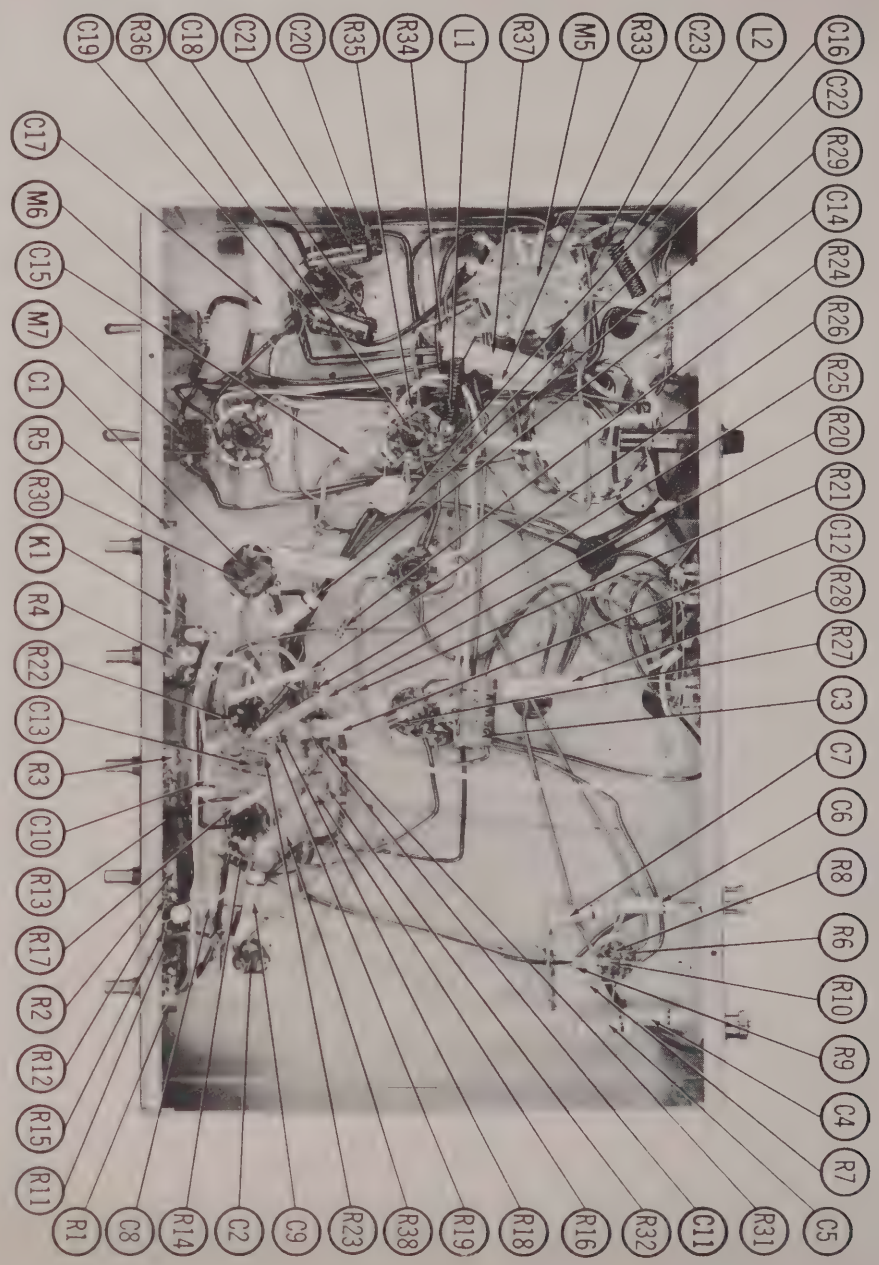
ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA Lafayette PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C5	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C6	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C7	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C8	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C10	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C11	250				DI-250	DD-251	LL10T25		5GA-T25	①
C12	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	1000		10%		DI-1000			JL-210	5GA-DI8 10% *	
C14	.047	400			P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C15	1000	2000			HVD-30-1000			2HV-210	20HKB-D1	④
C16	1000	2000			HVD-30-1000			2HV-210	20HKB-D1	④
C17	.5	200			P288N-5		CUB2P5	GEM-205	2TM-P5	④
C18	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	③
C19	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	③
C20	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	④
C21	.1	200			P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	④
C22	250		10%		DI-250		LL10T25		5GA-T25S 10% *	
C23	250		10%		DI-250		LL10T25		5GA-T25S 10% *	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
① Not used in some versions.
② Some versions may use 4700mmf in this application.
③ When C18 is .2mfd, C19 is not used.
④ When C20 is .2mfd, C21 is not used.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Lafayette PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 1
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R2A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R3A	500K	½	GVC-500K	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R4A	1 meg	½	GTC-1 meg	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R5A	1 meg	½	GTC-1 meg	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

CHASSIS-BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Lafayette PART No.	NOTES
R6	3.3meg			①
R7	470K			
R8	3.3meg			①
R9	470K			
R10	220K			
R11	470K			
R12	470K			
R13	470K			
R14	3.3meg			①
R15	4.7meg			
R16	100K 5%			
R17	100K 5%			
R18	470K			
R19	10K			②
R20	100K 5%			
R21	220K			
R22	47Ω			
R23	1000Ω			
R24	270K			
R25	47K			
R26	100K 5%			
R27	68K	2		
R28	200Ω	10		
R29	5600Ω	6		
R30	1000Ω			③
R31	10K			
R32	10K			
R33	20Ω	5		④
R34	20Ω	5		②
R35	47Ω			
R36	47Ω			
R37	10Ω	10		
R38	1000Ω			

① Some versions may use 4.7meg in this application.
② Not used in some versions.
③ Some versions may use 2700Ω in this application.
④ Some versions may use 30Ω in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Lafayette PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Fil. Choke		19-1000	BC-561	4602		1.1 Microhenries
L2	Fil. Choke		19-1000	BC-561	4602		1.1 Microhenries

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA Lafayette PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6V BATTERY OPERATION PRI. 1: 6 V Ⓐ 8A; PRI 2: 6 V Ⓐ 8 A; SEC. 1: 750 VCT Ⓐ .140A SEC. 2: 117 V Not used 12V BATTERY OPERATION PRI. 1: 12 V Ⓐ 7A; PRI 2: 12 V Ⓐ 7A; SEC. 1: 750 VCT Ⓐ .140A SEC. 2: 117 V Not used AC OPERATION PRI.: 117 V Ⓐ .980A; SEC. 1: 760 VCT Ⓐ .140A; SEC. 2: 8 VCT Not used SEC. 3: 8 VCT Not used Tap Ⓐ 6.3 V Ⓐ 4 A	TPM-2						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Lafayette PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6000Ω CT	500Ω Taps Ⓐ 200Ω (70V) 16Ω 8Ω 4Ω	CH-1		A-3130		A-3801	24S57		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Lafayette PART No.	REPLACEMENT DATA
K1	Tone Comp.	3000mmf, 3000mmf, 470mmf, 68K, 68K, 68K, 10K		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA Lafayette PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	6V or 12V	60∿		6VB6H		6VB6H	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Lafayette PART No. FUSE	Lafayette PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	3AG	25A 32V			311025. (25A 32V)	357001	AGC25	4406
M3	3AG	3A 250V			312003. (3A 250V)	342001	AGC3	HKP

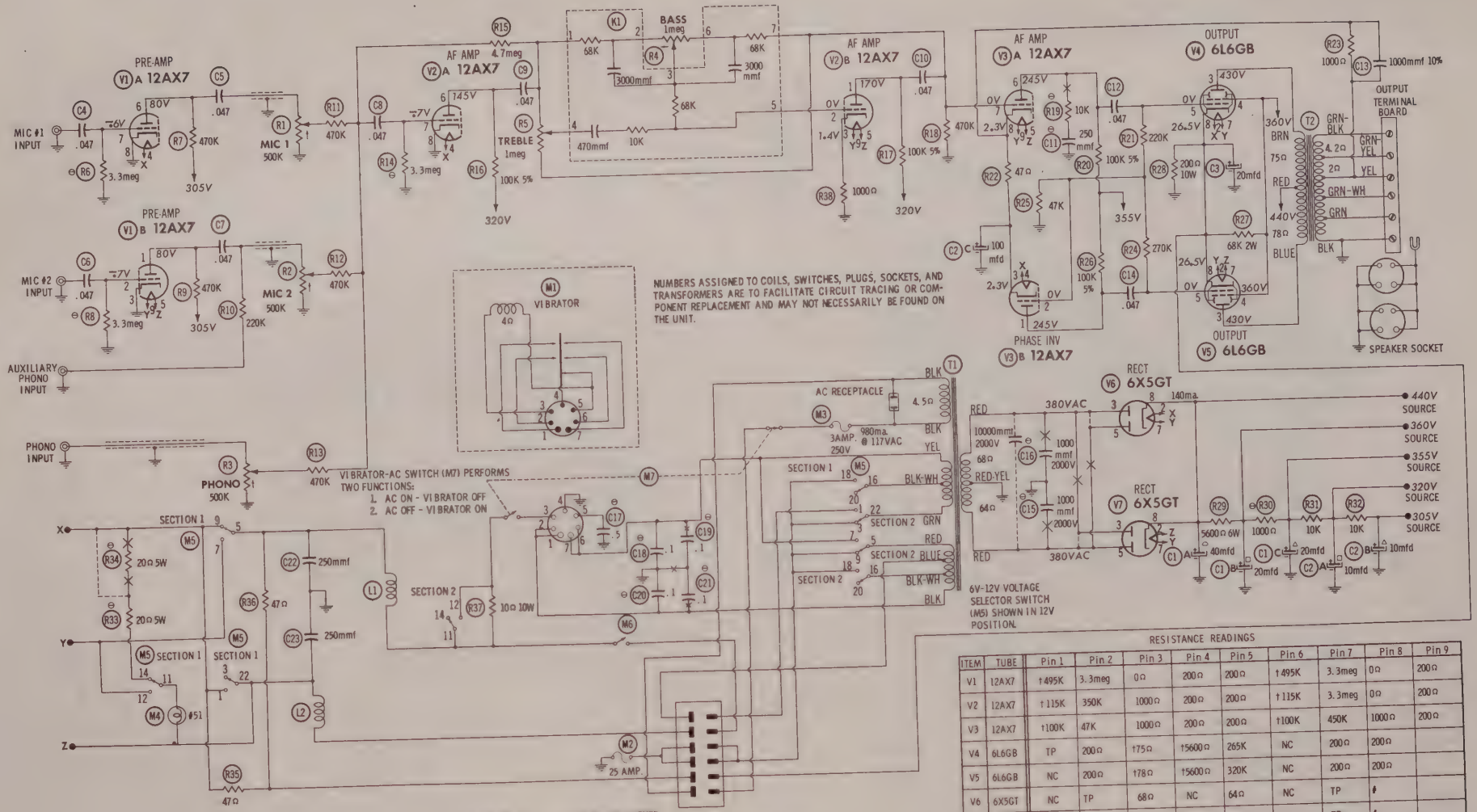
MISCELLANEOUS

ITEM No.	PART NAME	Lafayette PART No.	NOTES
M4	Lamp		#51
M5	Switch		Voltage Selector (Rotary Wafer Type)
M6	Switch		Filament-On-Off (SPST, Toggle Type)
M7	Switch		AC Off Vibrator On-Vibrator Off AC On (DPDT, Toggle Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†495K	3.3meg	0Ω	200Ω	200Ω	†495K	3.3meg	0Ω	200Ω
V2	12AX7	†115K	350K	1000Ω	200Ω	200Ω	†115K	3.3meg	0Ω	200Ω
V3	12AX7	†100K	47K	1000Ω	200Ω	200Ω	†100K	450K	1000Ω	200Ω
V4	6L6GB	TP	200Ω	†75Ω	†5600Ω	265K	NC	200Ω	200Ω	
V5	6L6GB	NC	200Ω	†78Ω	†5600Ω	320K	NC	200Ω	200Ω	
V6	6X5GT	NC	TP	68Ω	NC	64Ω	NC	TP	#	
V7	6X5GT	TP	TP	68Ω	NC	64Ω	TP	TP	#	

THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

VOLTAGE SELECTOR SWITCH (M5) TERMINAL GUIDE (SHAFT END VIEW)

AC POWER SOCKET

DC POWER SOCKET

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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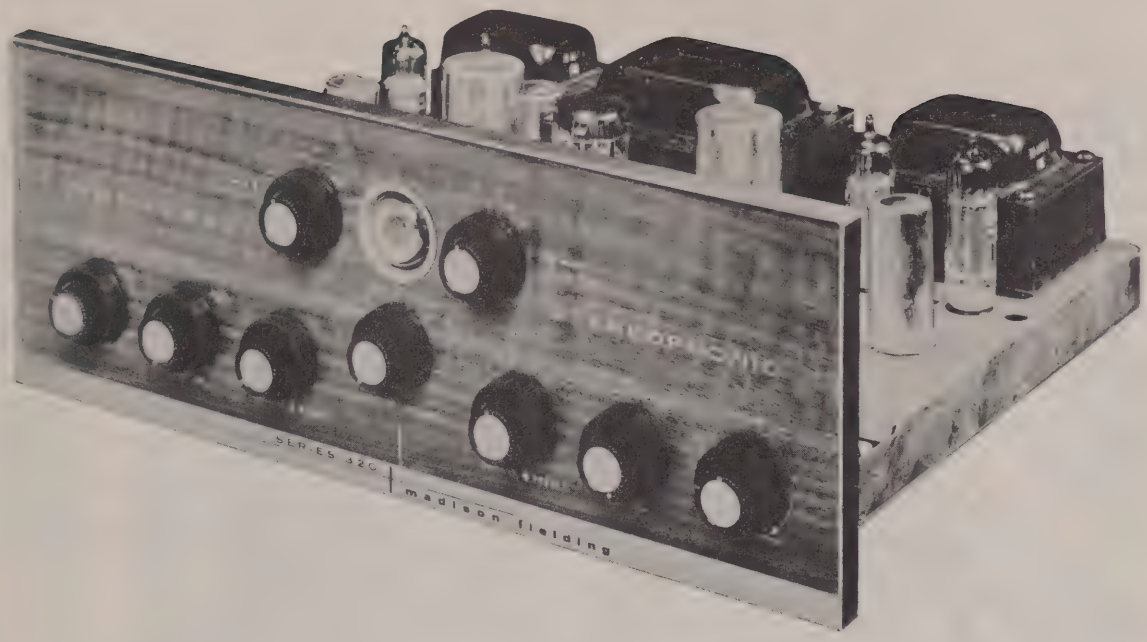
LAFAYETTE MODEL PA-64

PHOTOFACT* Folder

MADISON FIELDING
MODEL 320

MADISON FIELDING
MODEL 320



MADISON FIELDING
MODEL 320

TRADE NAME	Madison Fielding Model 320		
MANUFACTURER	Madison Fielding Corp., 5 Lorimer Street, Brooklyn 6, N. Y.		
TYPE SET	AC Operated Stereo Amplifier		
TUBES	Thirteen		
POWER SUPPLY	110-120 Volts AC, 50-60 Cycles	RATING	120 Watts, 1.2 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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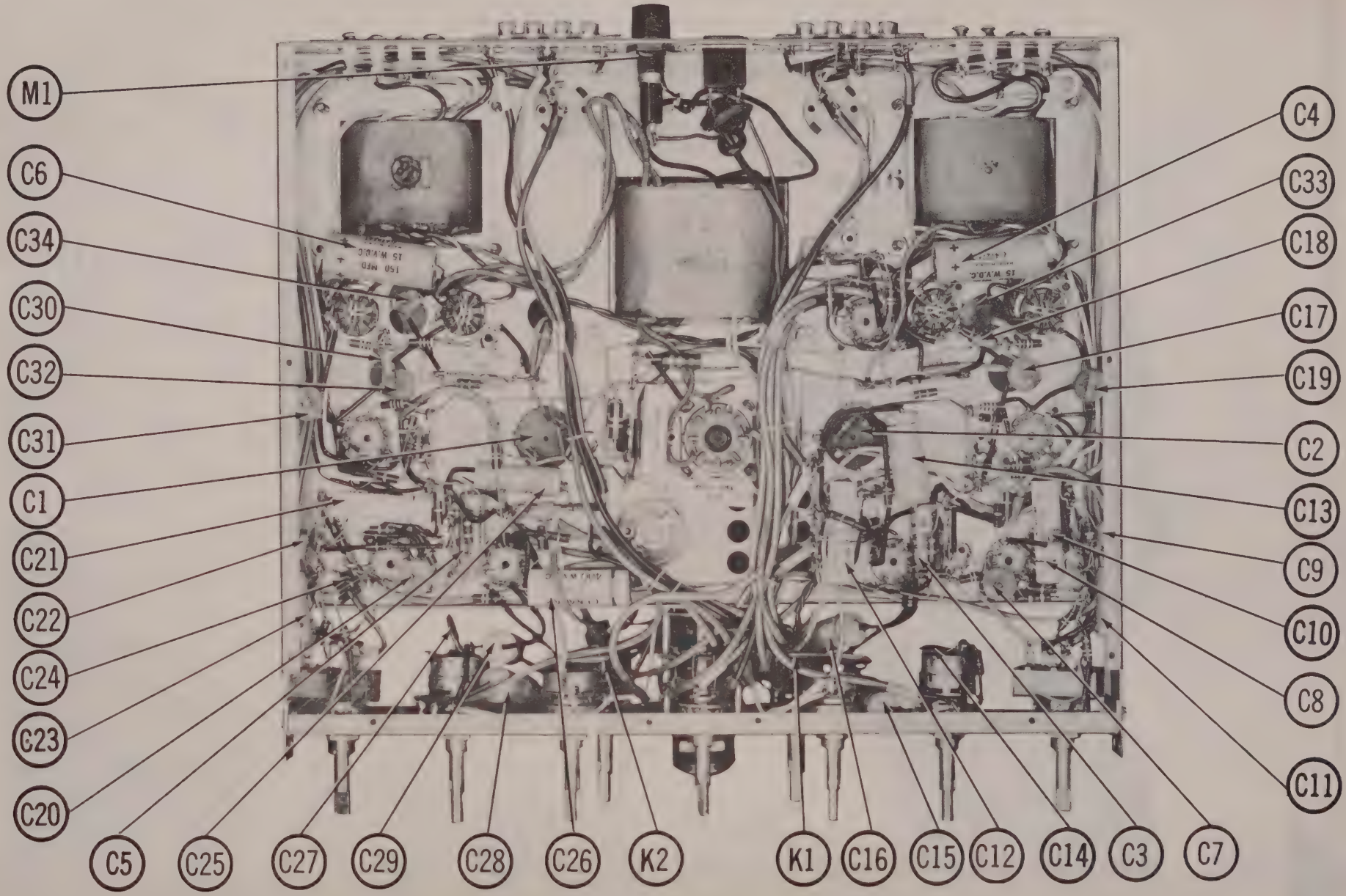
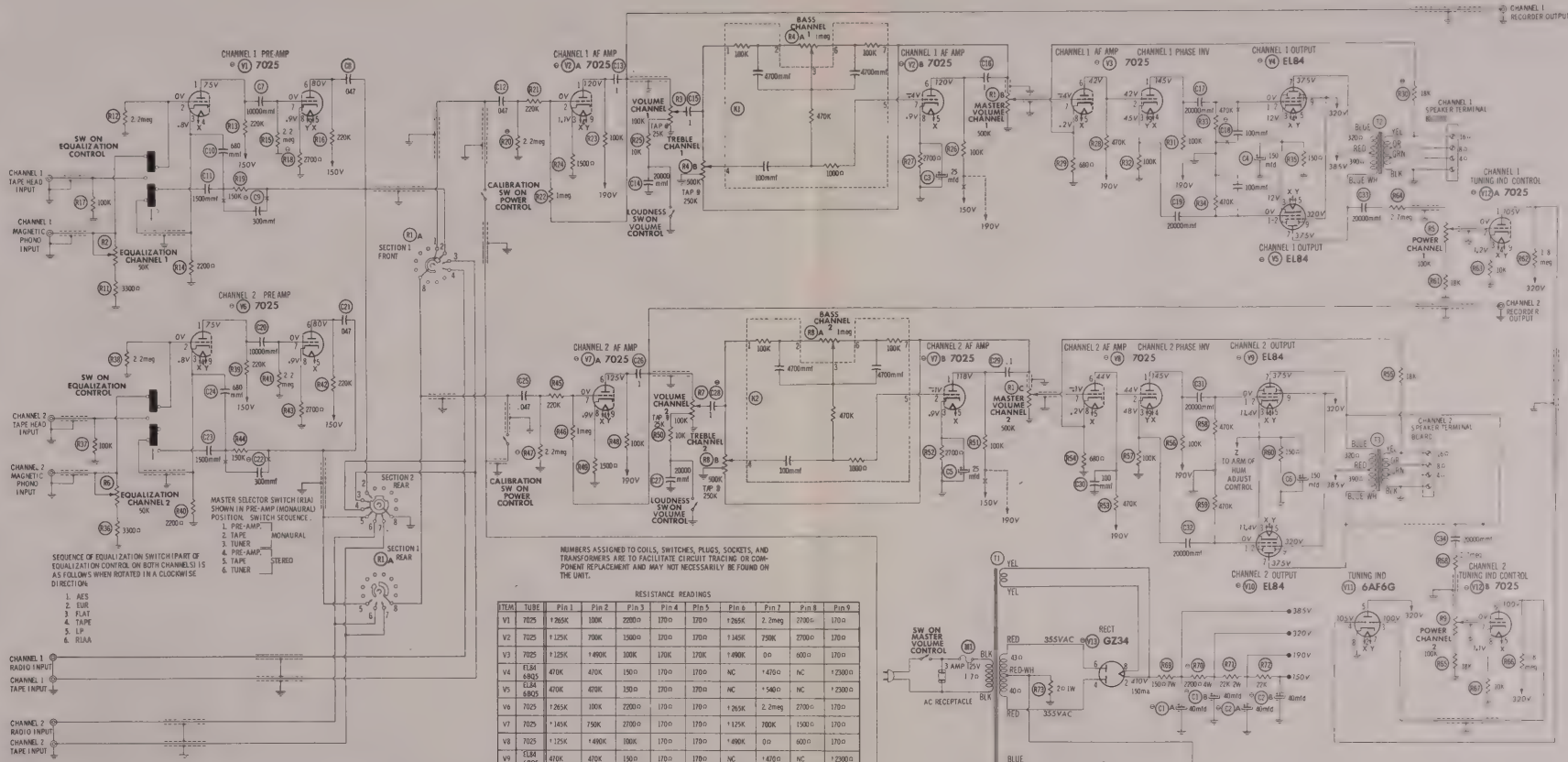
H862

DATE 5-59

SET 440 FOLDER 6



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	†265K	100K	2200Ω	170Ω	170Ω	†265K	2.2meg	2700Ω	170Ω
V2	7025	†125K	700K	1500Ω	170Ω	170Ω	†345K	750K	2700Ω	170Ω
V3	7025	†125K	†490K	100K	170K	170K	†490K	0Ω	600Ω	170Ω
V4	EL84 6BQ5	470K	470K	150Ω	170Ω	170Ω	NC	†470Ω	NC	†2300Ω
V5	EL84 6BQ5	470K	470K	150Ω	170Ω	170Ω	NC	†540Ω	NC	†2300Ω
V6	7025	†265K	100K	2200Ω	170Ω	170Ω	†265K	2.2meg	2700Ω	170Ω
V7	7025	†145K	750K	2700Ω	170Ω	170Ω	†125K	700K	1500Ω	170Ω
V8	7025	†125K	†490K	100K	170Ω	170Ω	†490K	0Ω	600Ω	170Ω
V9	EL84 6BQ5	470K	470K	150Ω	170Ω	170Ω	NC	†470Ω	NC	†2300Ω
V10	EL84 6BQ5	470K	470K	150Ω	170Ω	170Ω	NC	†540Ω	NC	†2300Ω
V11	6AF6G	NC	170Ω	†1.8meg	†1.8meg	†2300Ω	NC	170Ω	0Ω	
V12	7025	†1.8meg	18K	19K	170Ω	170Ω	†1.8meg	18K	10K	170Ω
V13	GZ34	NC	¶	NC	42Ω	NC	45Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 2 OF V13.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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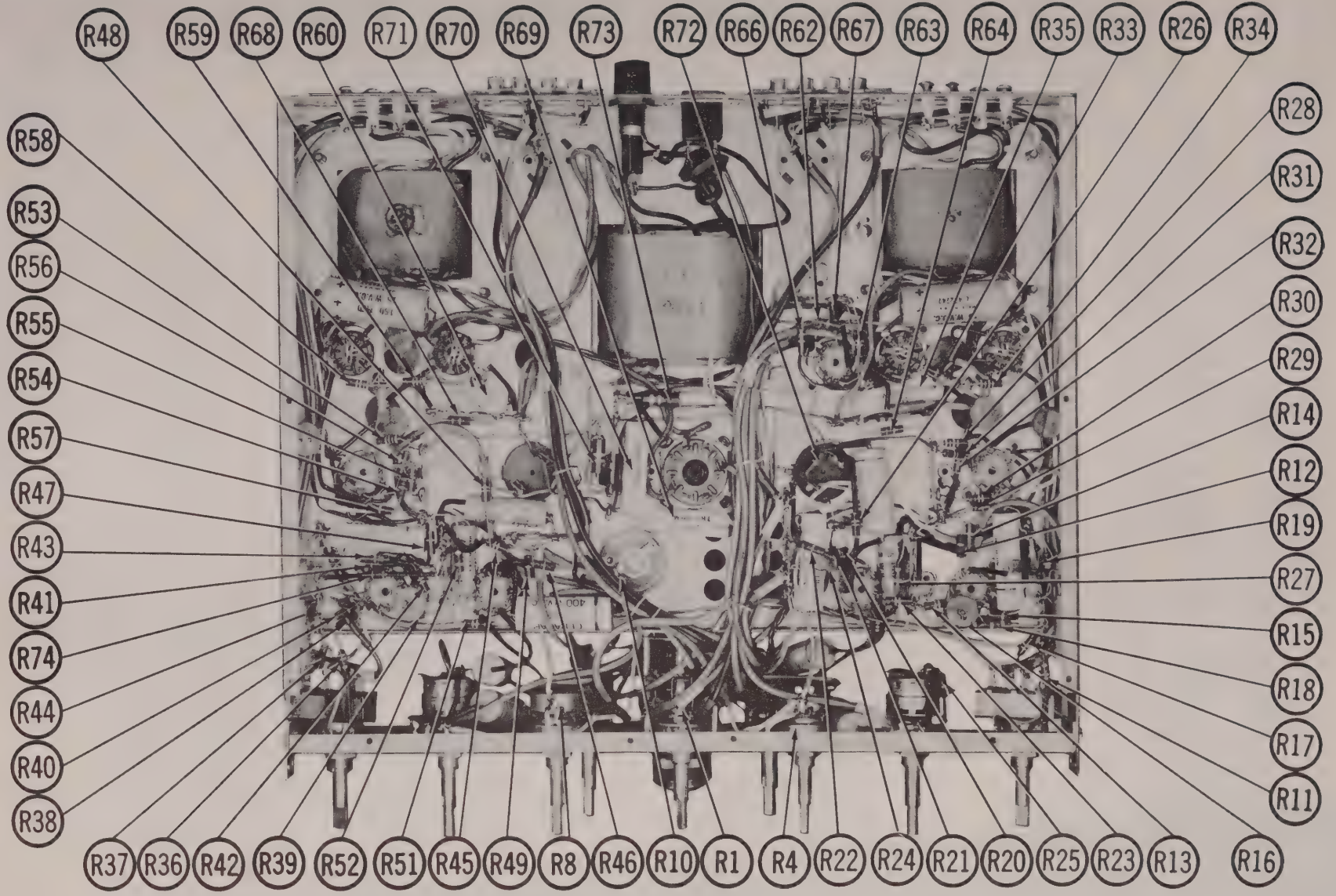
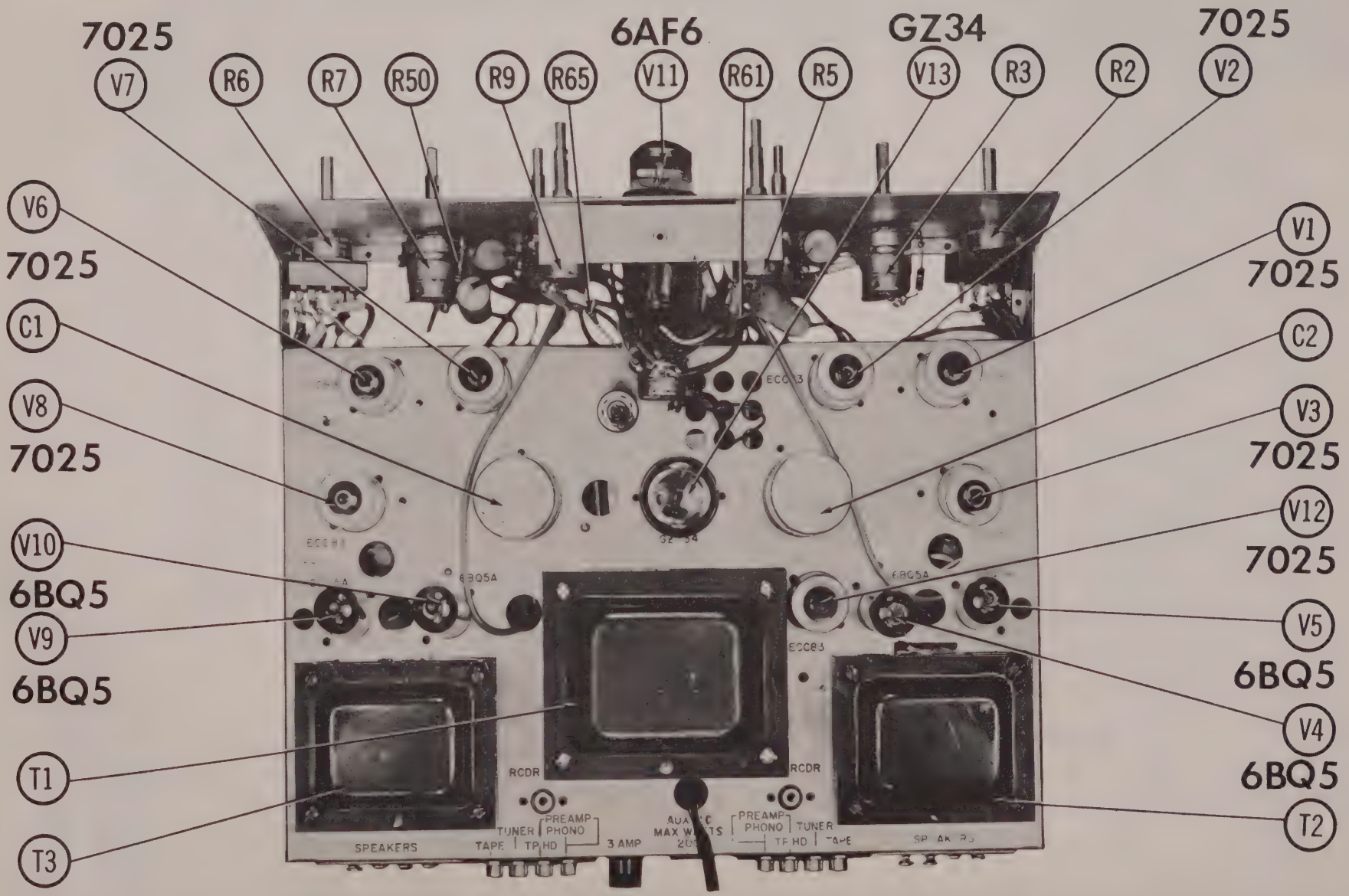
MADISON FIELDING
MODEL 320



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MADISON FIELDING
MODEL 320



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Channel 1 Preamplifier	7025	①
V2	Channel 1 AF Amplifier	7025	①
V3	Channel 1 AF Amp. - Phase Inverter	7025	①
V4	Channel 1 Output	EL84/6BQ5	②
V5	Channel 1 Output	EL84/6BQ5	②
V6	Channel 2 Preamplifier	7025	①
V7	Channel 2 AF Amplifier	7025	①
V8	Channel 2 AF Amp. - Phase Inverter	7025	①
V9	Channel 2 Output	EL84/6BQ5	②
V10	Channel 2 Output	EL84/6BQ5	②
V11	Tuning Indicator	6AF6G	
V12	Tuning Indicator Control	7025	①
V13	Rectifier	GZ34/5U4G	②

① Some versions may use type ECC83/12AX7 in this application.
② Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Madison Fielding PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	CE-4020 ①	AFH2-57	B0450	FP238	TMD-54	D-235	TVL-2764
B	▲40	450							
C2A	▲40	450	CE-4020 ①	AFH2-57	B0450	FP238	TMD-54	D-235	TVL-2764
B	▲40	450							
C3	25	3	CE-25003	SRE3V25	BBR25-3	TT3X25	ML25-3	MMT-325	TE-1055
C4	150	15		SRE15V100	BBR100-15	TC25015	TD-100-15	MTH-1510	TE-1163
C5	25	3	CE-25003	SRE3V25	BBR25-3	TT3X25	ML25-3	MMT-325	TE-1055
C6	150	15		SRE15V100	BBR100-15	TC25015	TD-100-15	MTH-1510	TE-1163

① In some versions C1A may be combined with C2 in three section unit (Part #CE-3X4023).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Madison Fielding PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C7	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C8	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C9	300			SI 300	D6-301	LT6T3	UC-533	5GA-T3	①
C10	680			BPD-00068	D6-681	BYA10T68	UC-5368	5GA-T68	
C11	1500			SI 1500	D6-152	LT6D15	UC-5215	5GA-D15	
C12	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C14	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C15	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C16	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C17	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C18	100			SI 100	DC-101	LT6T1	UC-531	5GA-T1	①
C19	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C20	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C21	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C22	300			SI 300	D6-301	LT6T3	UC-533	5GA-T3	①
C23	1500			SI 1500	D6-152	LT6D15	UC-5215	5GA-D15	
C24	680			BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	
C25	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C26	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C27	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C28	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	②
C29	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C30	100			SI 100	D6-101	LT6T1	UC-531	5HK-T1	
C31	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C32	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C33	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C34	20000			BPD-02	DD-203	BYB6S2		5HK-S2	

① Not used in some versions. ② Some versions use 10000mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Madison Fielding PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch							Master Selector
B	500K	½	SF-1010					Master Volume, Channel 1
C	500K	½						Master Volume, Channel 2
D	Switch							On-Off
R2A	50K	½	RV-1003-2					Equalization, Channel 1
B	Switch							Function, Slide Type
R3A	100K	½	RV-1005					Volume, Tap ② 25K, Ch. 1
B	Switch							Loudness
R4A	1meg	½	RV-1004	F1-51			■ UE3896	Bass, Channel 1
B	500K	½		R4-42				Treble, Tap ② 250K
R5A	100K	½	RV-1140					Power, Channel 1
B	Switch							Calibration
R6A	50K	½	RV-1003-2					Equalization, Channel 2
B	Switch							Function, Slide Type
R7A	100K	½	RV-1005					Volume, Tap ② 25K, Ch. 2
B	Switch							Loudness
R8A	1meg	½	RV-1004	F1-51			■ UE3896	Bass, Channel 2
B	500K	½		R4-42				Treble, Tap ② 250K
R9A	100K	½	RV-1140					Power, Channel 2
B	Switch							Calibration
R10A	100Ω	2(WW)	RW-5001	WN-101	A43-100	W11-084	R100L	Hum Adjust
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

■ "STA-LOC" Equivalent : FA16L, OS1062, RU55T254, IS1562

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Madison Fielding PART No.	NOTES
R11	3300Ω			
R12	2.2meg			
R13	220K			
R14	2200Ω			
R15	2.2meg			
R16	220K			
R17	100K			
R18	2700Ω			
R19	150K			
R20	2.2meg			①
R21	220K			
R22	1meg			
R23	100K			
R24	1500Ω			
R25	10K			
R26	100K			
R27	2700Ω			
R28	470K			
R29	680Ω			
R30	18K			②
R31	100K			
R32	100K			
R33	470K			
R34	470K			
R35	150Ω			
R36	3300Ω			
R37	100K			
R38	2.2meg			
R39	220K			
R40	2200Ω			
R41	2.2meg			
R42	220K			

ITEM No.	RATING OHMS	RATING WATT	Madison Fielding PART No.	NOTES
R43	2700Ω			
R44	150K			
R45	220K			
R46	1meg			
R47	2.2meg			①
R48	100K			
R49	1500Ω			
R50	10K			
R51	100K			
R52	2700Ω			
R53	470K			
R54	680Ω			
R55	18K			
R56	100K			
R57	100K			
R58	470K			
R59	470K			
R60	150Ω			
R61	18K			
R62	1.8meg			
R63	10K			
R64	2.7meg			
R65	18K			
R66	1.8meg			
R67	10K			
R68	2.7meg			
R69	150Ω	7		
R70	2200Ω	4		③
R71	22K	2		
R72	22K			
R73	2Ω	1		
R74	68Ω			

① Some versions use 470K in this application.
② Some versions use 22K in this application.
③ Some versions use 2700Ω in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
				Madison Fielding PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	117V @ 1.2A	700VCT @ .150A	5V @ 1.8A	TP-1004		P-3072		PM8411	26R23	R-20B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 4.5A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
			Madison Fielding PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	PRI.	SEC.								
T2	8700Ω CT	16Ω Taps @ 8Ω, 4Ω	TO-1003-1		A-3128①					① Use original Shields
T3	8700Ω CT	16Ω Taps @ 8Ω, 4Ω	TO-1003-1		A-3128①					

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Madison Fielding PART No.	REPLACEMENT DATA
K1	Tone Compensation	1000Ω, 100K, 120K, 470K, 4700mmf, 4700mmf, 100mmf		Centralab PC-190
K2	Tone Compensation	1000Ω, 100K, 120K, 470K, 4700mmf, 4700mmf, 100mmf		Centralab PC-190

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Madison Fielding PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 125V S/B	FS3000		313003. (3A 125V S/B)	342001	MDX3	HKP

WIRING DATA

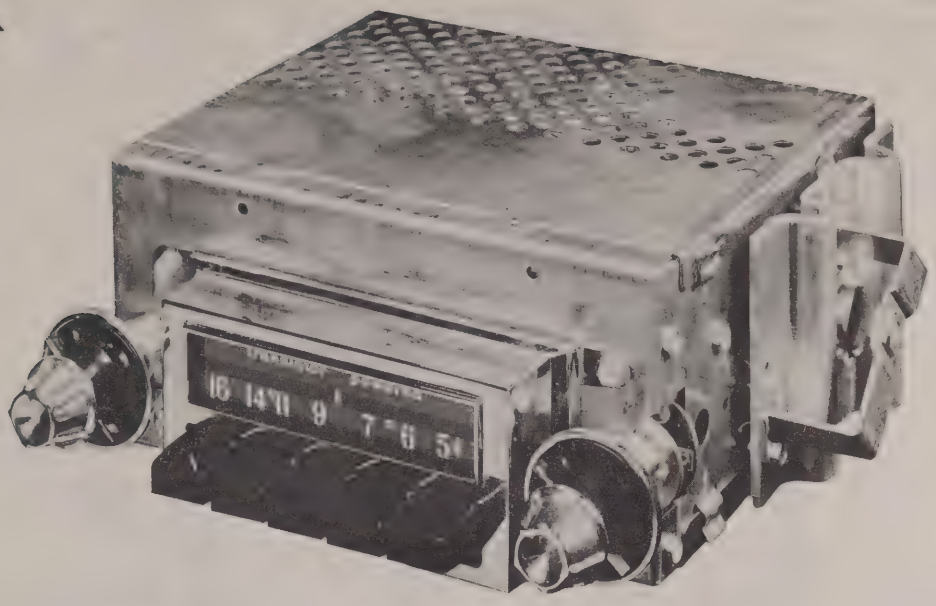
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA
MODEL CTA8X



TRADE NAME	Motorola Model CTA8X (For 1958 Chevrolet Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Five)	Types 12BL6 RF Amplifier, 12AD6 Converter, 12BL6 IF Amplifier, 12F8 Det.-AVC-AF Amp., 12K5 AF Amplifier
POWER SUPPLY	12 Volt Storage Battery — RATING 1.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540 - 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400∿ Mod.)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy antenna to antenna receptacle	1610KC	"	"	A5, A6, A7	"
	Steps 3 and 4 are not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) 7/16" out of coils. (Alignment tool Part #66A76278 may be used). Repeat step 2.						
3.	Fig. 1	Thru dummy antenna to antenna receptacle	1200KC	Tuner carriage 9/32" from high freq. end stop	Across voice coil	A8, A9, A10	Adjust for maximum output.
4.	"	"	1610KC	High frequency end stop	"	A5, A6, A7	Adjust for maximum output. Repeat steps 3 and 4 until no further improvement can be obtained.
5.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull out pushbutton. Press in firmly.
3. Repeat for remaining pushbuttons.

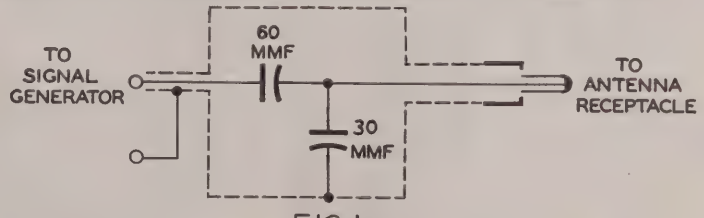


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H662

MOTOROLA
MODEL CTA8X

MOTOROLA
MODEL CTA8X

SET 440 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	
V3	IF Amplifier	12BL6	

ITEM No.	USE	TYPE	NOTES
V4	Det.-AVC-AF Amp.	12F8	
V5	AF Amplifier	12K5	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N176	Output	CBS-2N155	2N176		2N176	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■500	16	23B560487	AFH3-00-90		WP300. 51			R2664 *
B	▲100	16							
C	100	16							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

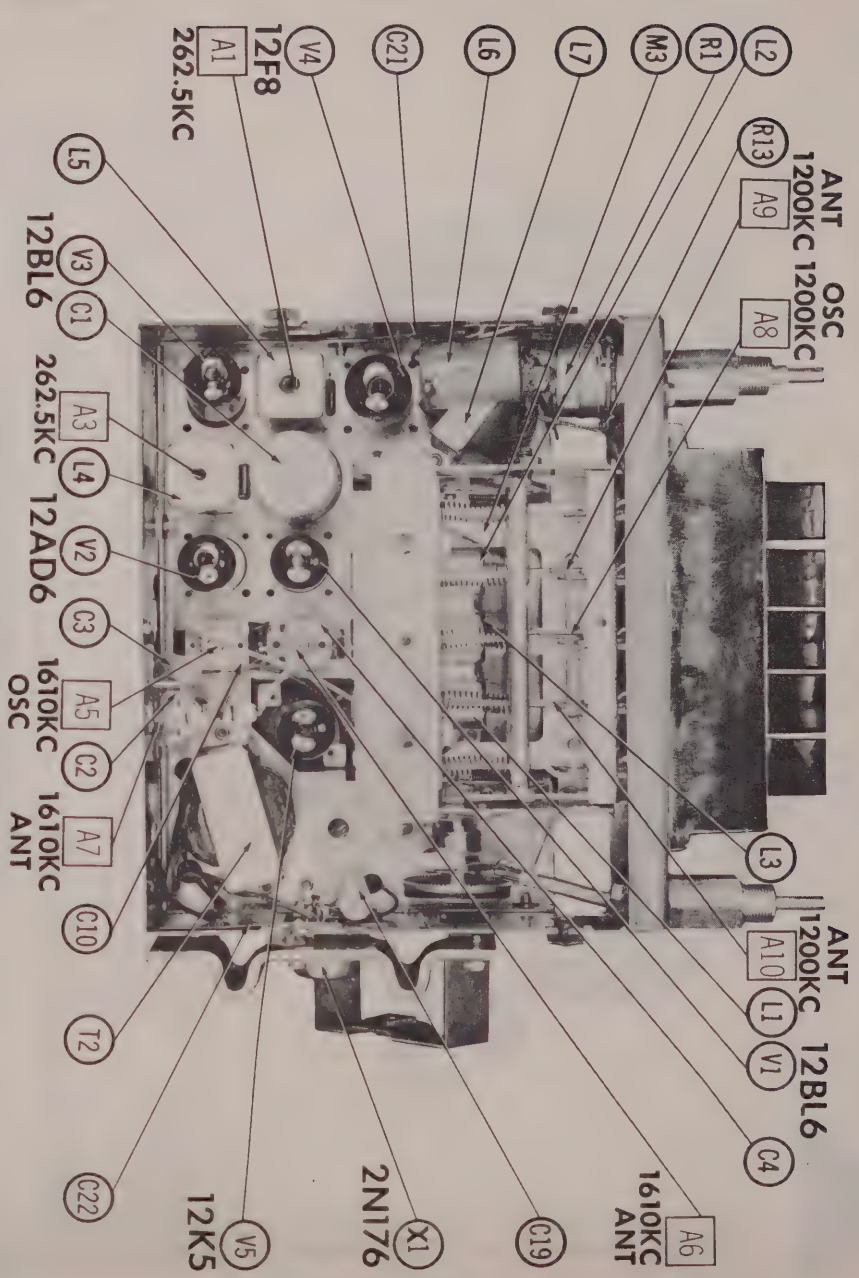
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	40-430		20K542441						
C3	. 003	600	8R121569	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C4	20-120		20K541014						
C5	47		21R114207	N750-DI 47	DTN-47	C10Q47U	NT-5447	5TCU-Q47	N750 10%
C6	. 05	200	8R121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C7	220		21K121698		MD-221	L10T22		5TCC-T22	10%
C8	47		21R115593	N750-DI 47	DTN-47	C10Q47U	NT-5447	5TCU-Q47	N750
C9	100		21R410036	N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750 10%
C10	310-390		20K541700						
C11	27		21R410089			C10Q27C			NPO 10%
C12	. 05	200	8R121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C13	10000		21R482726	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C14	. 002	600	8R121568	P288N-002	D6-202	CUB6D2	GEM-622	6TM-D2	
C15	10000		21R482726	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C16	. 05	200	8R121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C17	. 01	200	8R121668	P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C18	330		21R410118	DI 330	DD-331	L10T33	UC-5333	5GA-T33	
C19	. 02	200	8R121003	P288N-02	DD-203	CUB2S2	GEM-412	2TM-S2	
C20	. 5	100	8K121666	P288N-5		CUB2P5	GEM-205	2TM-P5	
C21			64K530177						
C22			64K530177						

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	18B542657	F1-41	RTV-654C	QJ-1083A		Tone
B	2. 2meg			R2-75	Not Req.	Not Req.	■ UE-38288	Volume, Tap ⓐ 1meg
C	Switch			KB-4	Not Req.	Not Req.		
R2	125Ω	2(WW)	18K542493		39-125		FL-150	Transistor Bias

■ "STA-LOC" Equivalent: FA55A, RU26T16, OS1562, IS2000. E41.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R3	22meg		6R488158	
R4	3300Ω		6K121725	
R5	22meg		6R488158	
R6	47K		6K121299	
R7	5.6meg		6R3988	
R8	91meg		6K538716	
R9	330Ω		6K127940	
R10	22K		6K119405	
R11	4.7meg		6K121277	
R12	6.8meg		6K121933	
R13	100K		6K122313	
R14	3.3meg		6K121278	
R15	120K		6K127540	
R16	270K		6R6414	
R17	3.3meg		6K121278	
R18	270Ω		6K121303	
R19	27Ω		6B119401	
R20	47Ω	2	6K121419	
R21	5.6Ω	1(WW)	6K488139	
R22	10Ω Cold		6K540634	
R23	220Ω		6R6270	
R24	470Ω		6K127633	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Antenna Coil	24C535458					Part of M3.
L2	Antenna Coupling	24C535458					Part of M3.
L3	Osc. Coil	24C535456					Part of M3.
L4	Input IF	24B542748	16-6752	BC-350	12-H1	RF-3	
	Input IF	24K542491	16-6752	BC-350	12-H1	RF-3	Alternate
L5	Output IF	24K542675	16-6754	BC-354	12-H6		
L6	"A" Lead Choke	24A472535					

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L7	.56A	.6Ω	.011 Hy.	25K541701						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	6.5	:1	25K542676			TA-43			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	23.5Ω Tap @ 3-4Ω	25C542489							

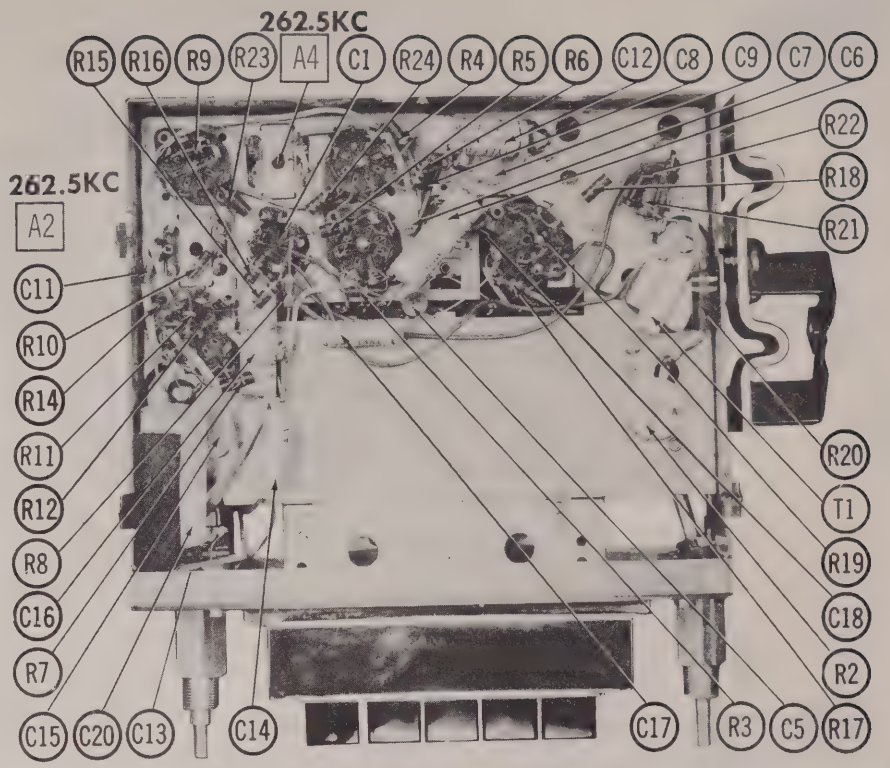
SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	3-4Ω	50K541105	69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MOTOROLA PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M1		10A 32V	55R10266					

CHASSIS—BOTTOM VIEW



MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Lamp	65R533821	#1891
M3	Tuner	77K541218	AT-214, Complete

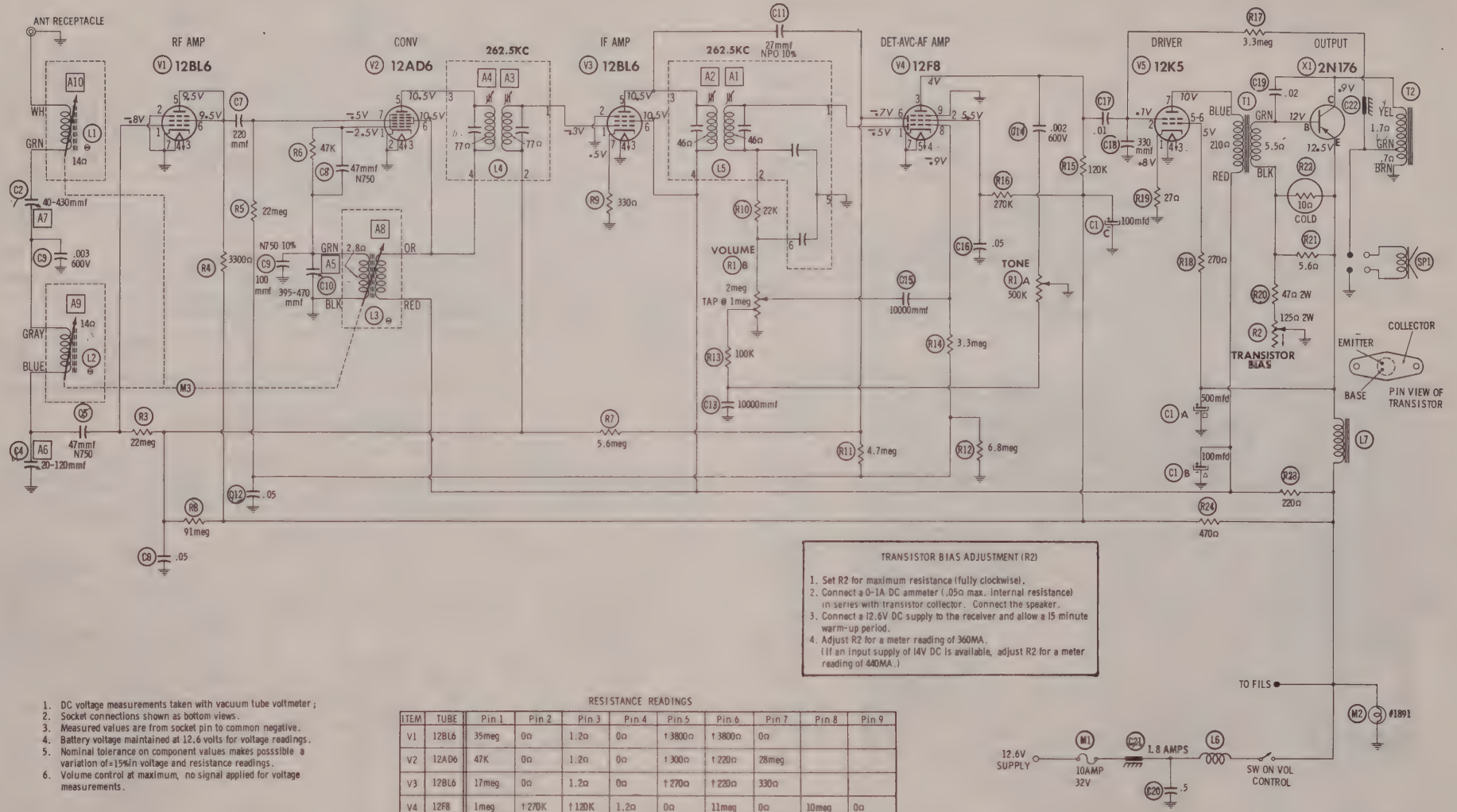
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36B542650	On-Off-Volume, Tuning
Knob	36B542663	Tone
Knob	36K542664	Dummy
Pushbutton	38B542665	Station Selector, Five used
Dial Pointer	1V538789	
Dial Scale	34B542837	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



TRANSISTOR BIAS ADJUSTMENT (R2)

1. Set R2 for maximum resistance (fully clockwise).
2. Connect a 0-1A DC ammeter (.05Ω max. internal resistance) in series with transistor collector. Connect the speaker.
3. Connect a 12.6V DC supply to the receiver and allow a 15 minute warm-up period.
4. Adjust R2 for a meter reading of 360MA. (If an input supply of 14V DC is available, adjust R2 for a meter reading of 440MA.)

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	35meg	0Ω	1.2Ω	0Ω	†3800Ω	†3800Ω	0Ω		
V2	12AD6	47K	0Ω	1.2Ω	0Ω	†300Ω	†220Ω	28meg		
V3	12BL6	17meg	0Ω	1.2Ω	0Ω	†270Ω	†220Ω	330Ω		
V4	12F8	1meg	†270K	†120K	1.2Ω	0Ω	11meg	0Ω	10meg	0Ω
V5	12K5	27Ω	3.3meg	1.2Ω	0Ω	†270Ω	†270Ω	†430Ω		

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF L7 AND R24.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA
MODEL CTA8X

PHOTOFACT* Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PHILCO MODEL T-3
(Codes 124, 126, 128, 130)

PHILCO MODEL T-3
(Codes 124, 126, 128, 130)

PHILCO MODEL T-3
(Codes 124, 126, 128, 130)

TRADE NAME	Philco Model T-3 (Codes 124, 126, 128, 130)
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	2.6 Volts DC
RATING	2.2MA @ 2.6 Volts DC
TUNING RANGE—BROADCAST	550 - 1550KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2..... General Cement #5009, 8195, 8274, 8275, 8728
Walsco #2515, 2531, 2532

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	600KC (400~ Mod.)	Antenna 600KC RF Mid position	Across earphone	A1, A2.	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Core should not extend above top of transformer can.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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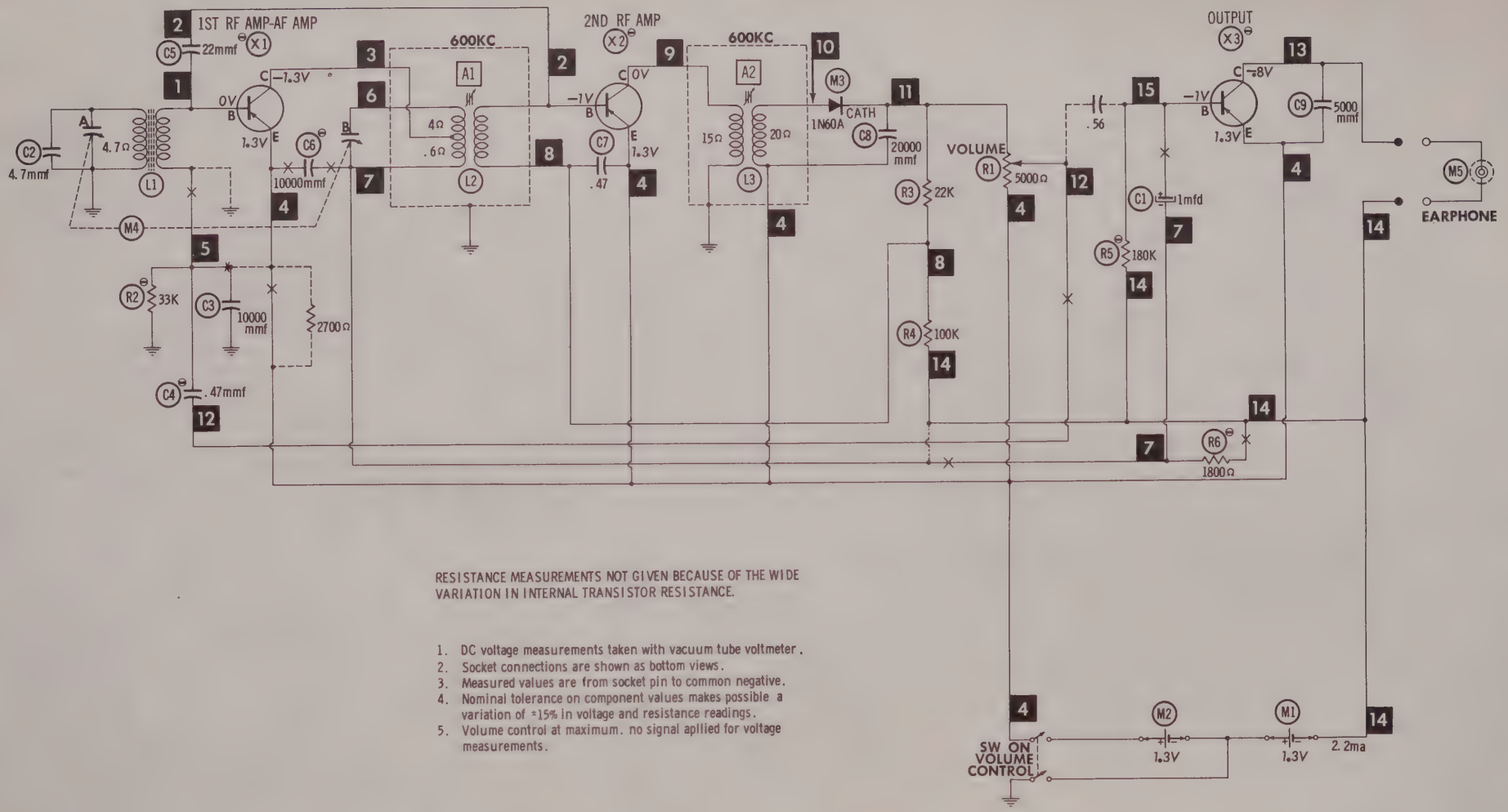
SET 440 FOLDER 8



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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PHILCO MODEL T-3
(Codes 124, 126, 128, 130)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	T-1305	1st RF Amp. -AF Amp					PNP
X2	T-1306	2nd RF Amplifier					PNP
X3	T-0041 *	Output					PNP

* T-0038 used in Code 124, T-0039 used in Code 126, T-0040 used in Code 128.
T-0041 (Part #34-6001-21) is used for all replacements, and R5 must be changed to 180K.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	1	6	①	XPP-6001	NL1-6	TT12X1	ML1-6		TE-1080

① Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	4.7		30-1221-5	NPO-SI4.7	TCZ-4R7	CTA6V47C	ZT-5547	5TCCB-V47	
C3	10000		30-1272-2					TG-S10	①
C4	.47								
C5	22		62-0224409011	NPO-SI22	TCZ-22	CTA6Q22C		5TCC-Q22	
C6	10000		30-1272-2					TG-S10	①
C7	.47								
C8	20000		30-1272-3						
C9	5000		30-1272-1					TG-D50	

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	33-5583-4					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

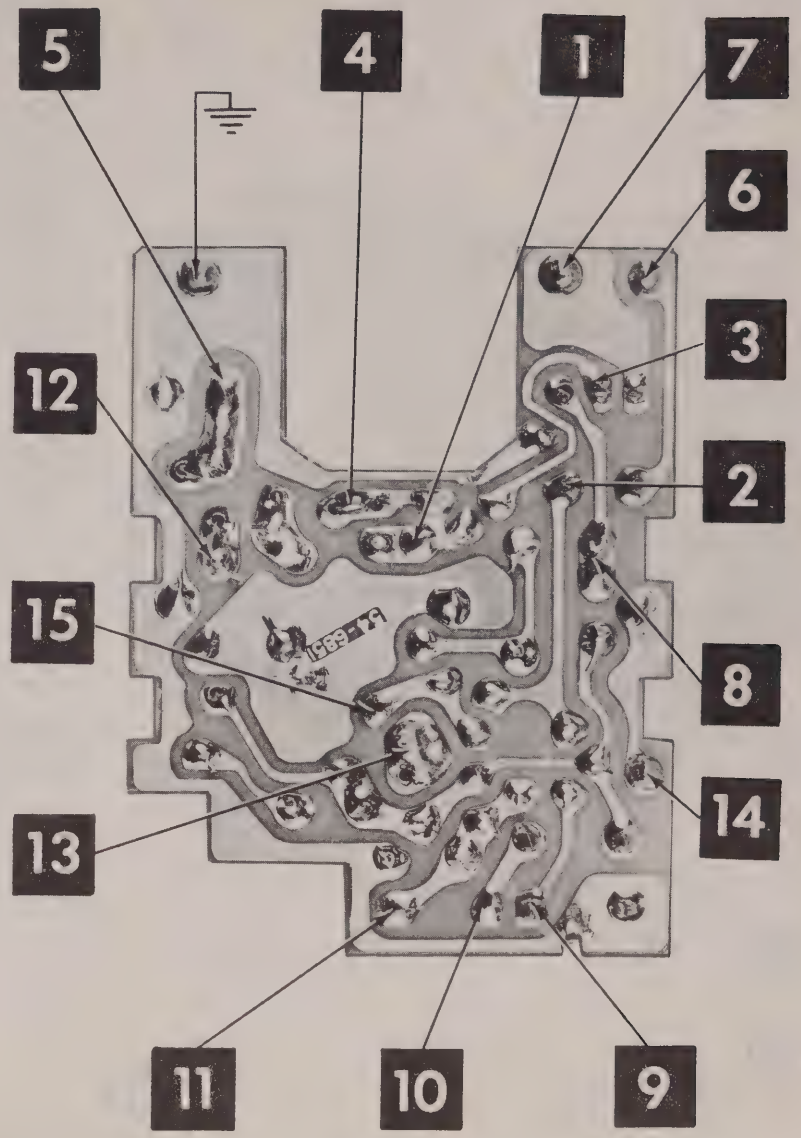
ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R2	33K			①
R3	22K		66-3228340	
R4	100K		66-4108340	

ITEM No.	RATING		PHILCO PART No.	NOTES
	OHMS	WATT		
R5	180K			②
R6	1800Ω			①

① Not used in some versions.
② Not used in Code 124 versions.
Code 126 uses 100K (Part #66-4108340), Code 128 uses 330K (Part #66-4338340), Code 130 uses 180K (Part #66-4188340).

PRINTED BOARD

A Howard W. Sams CIRCUITRACE Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		PHILCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	32-4764-1					
L2	1st RF Trans.	32-4763-1					
L3	2nd RF Trans.	32-4763-2					

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.3V	P-630 ①				E630E ①		RM630R ①	① Mercury Type
M2	1.3V	P-630 ①				E630E ①		RM630R ①	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		PHILCO PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N60A	34-8022-3	1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4A	Tuning Cap.	76-10539	Includes Knob, Ant. 13 - 167mmf
B	Tuning Cap.		Includes Knob, RF. 13 - 167mmf
M5	Ear Phone Ass'y.	326-8007	
	Printed Board	54-6851	Alternate Part #54-6676

CABINETS & CABINET PARTS

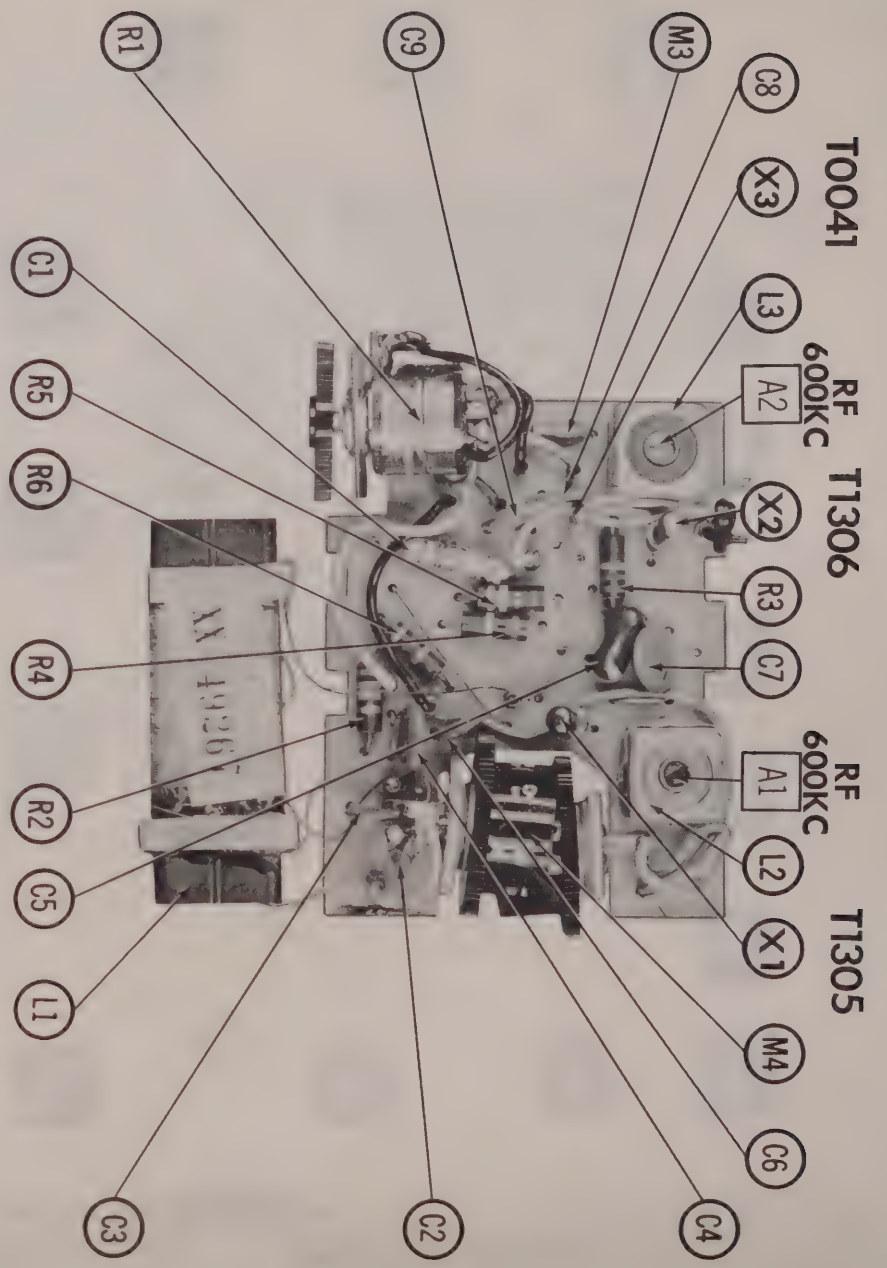
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	76-10539	2 Used, Includes M3
Knob	54-6682-1	Off-On-Volume
Cabinet	51-0007	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW

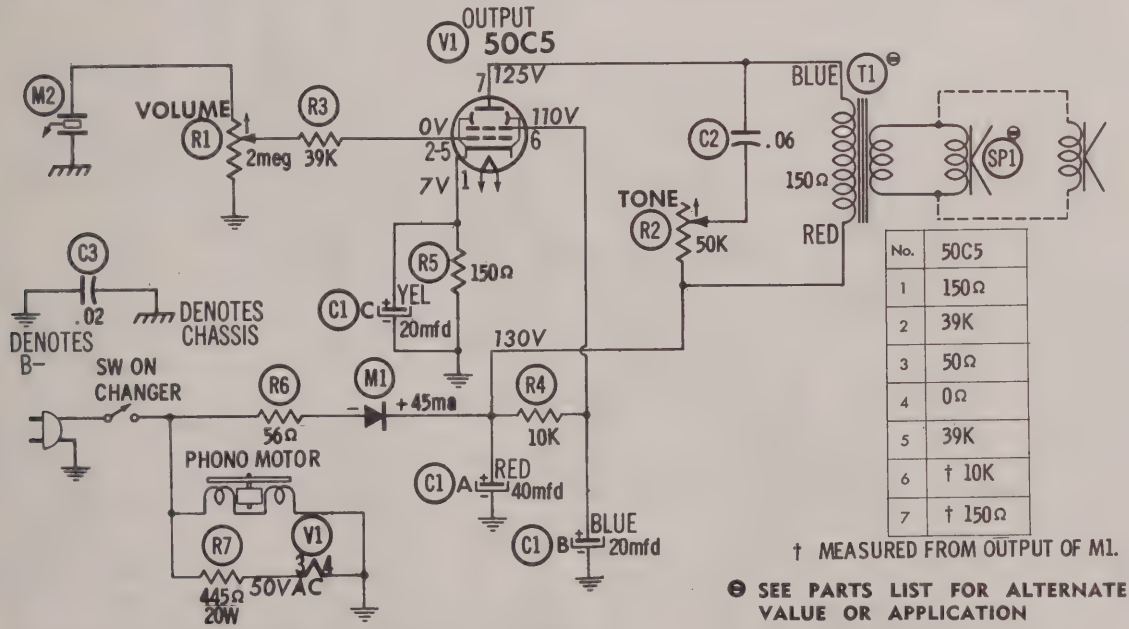


PHOTOFACT* Folder

MODEL 758

TRADE NAME	Phonola Models 758, 2058
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minnesota
TYPE SET	AC Operated One Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 27 Watts, .26 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13094 - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11.



No.	50C5
1	150Ω
2	39K
3	50Ω
4	0Ω
5	39K
6	† 10K
7	† 150Ω

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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H951

PHONOLA
MODELS 758, 2058

PHONOLA
MODELS 758, 2058

SET 440 FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING			REPLACEMENT DATA					
	CAP.	VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	12144	PRS150/25V4020/20	BBRT4215C		TDLT-12	TVA-3423	
B	20	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.06	200		11509	P288N-06		CUB6S6	GEM-416	6TM-S6	
C3	.02	200		11508	P288N-02		CUB2S2	GEM-412	2TM-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	12603	B-76 †	A47-50K-Z †	Q13-123 †	U33 †	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	50K	½	11749	B-32 †	A47-50K-Z †	Q13-123 †	U33 †	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

† Counter sink mounting hole in cabinet to accommodate bushing type control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PHONOLA PART No.	NOTES
	OHMS	WATT		
R3	39K		9144	
R4	10K		9273	
R5	150Ω		9897	

ITEM No.	RATING		PHONOLA PART No.	NOTES
	OHMS	WATT		
R6	56Ω		11744	
R7	445Ω	20	10585	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω	3-4Ω	Part of SP1①	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	① Model 758
	2000Ω	1-2Ω	11876 ②	Z1001				24S51		② Model 2058

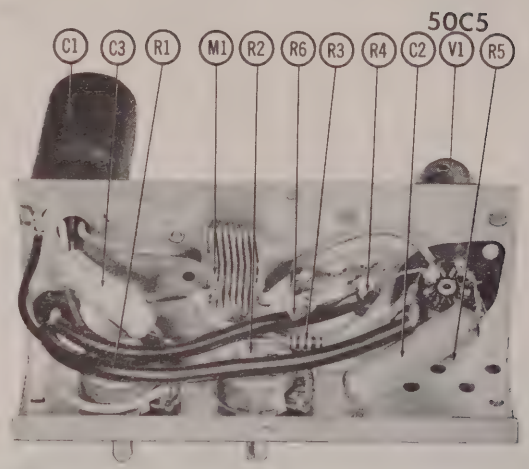
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	11752 ①	4A07	① Used in Model 758 (Includes T1)
	4"	PM	3-4Ω	11792 ②	4A07	② Two used in Model 2058

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	PHONOLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.045A	11756	1234AH	T065 SD-94①	K200①	① Silicon Type

CHASSIS-BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHONOLA PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	13211	310TB	N8-1 and N8-3	6	CRA-55 & CRA-55LP or CRA-55D & CRA-55LPD	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	JENSEN PART No.	WALCO PART No.	
M3	13212 (78)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	13213 (LP)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS or ♦ W-64MGD	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	12126-4E	2 Used, Model 758
Knob	12126-7E	2 Used, Model 2058
Handle	12161-6B	Model 758
Handle	13056-8B	Model 2058

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

*TRADE MARK

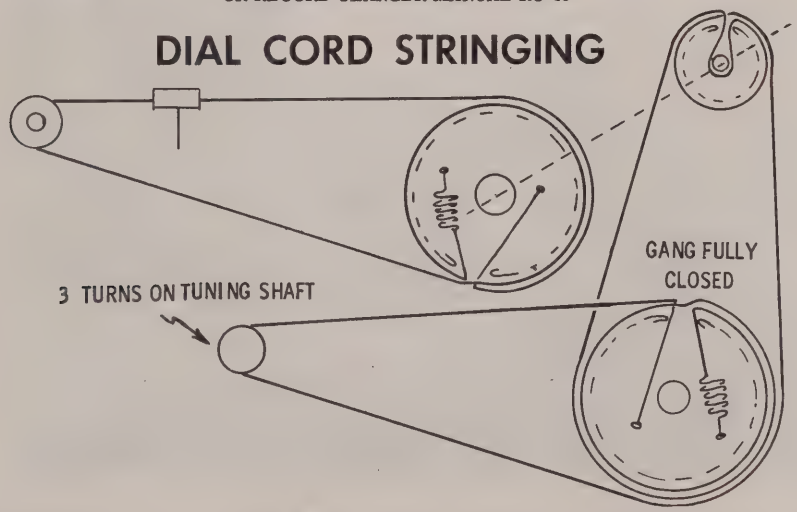
RCA VICTOR MODELS SHC7, SHC8, A, SHP7, SHP8, SHP11, 9T2 (Ch. RC-1155AX, RC-1155B, RS-171, RS-171A)

MODEL SHC8A

TRADE NAME	RCA Victor
	Models: 9-T-2 (FM-AM Tuner Ch. RC-1155AX or RC-1155B) SHC-7 (FM-AM Tuner Ch. RC-1155B Amp. Ch. RS-171, Changer RP-205G-1) SHC-8 (FM-AM Tuner Ch. RC-1155AX, Amp. Ch. RS-171, Changer RP-205C-2X or RP-205E-2X) SHC-8A(FM-AM Tuner Ch. RC-1155AX, Amp. Ch. RS-171, Changer RP-205C-2X or RP-205E-2X) SHP-7 (Amp. Ch. RS-171, Changer RP-205G-1) SHP-8 (Amp. Ch. RS-171, Changer RP-205C-2X or RP-205E-2X) SHP-11 (Amp. Ch. RS-171A, Changer RP-205H-1) (Model SHP-11 Accessories: SHS-11 Speaker Cabinet; RF-11, SHR-11 Record Storage Cabinets; STD-2 Two Unit Stand; STD-3 Three Unit Stand)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TUBES	Tuner: 8 Amp.: 6
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	Tuner: 31 Watts, .33 Amp. @ 117 Volts AC Amp.: 69 Watts, .7 Amp. @ 117 Volts AC
TUNING RANGES	BROADCAST 540 - 1600KC FREQ. MOD. 88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA RP-205 SERIES - PHOTOFACT SET 358 FOLDER 10 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



RCA VICTOR MODELS SHC7, SHC8, A, SHP7, SHP8, SHP11, 9T2 (Ch. RC-1155AX, RC-1155B, RS-171, RS-171A)

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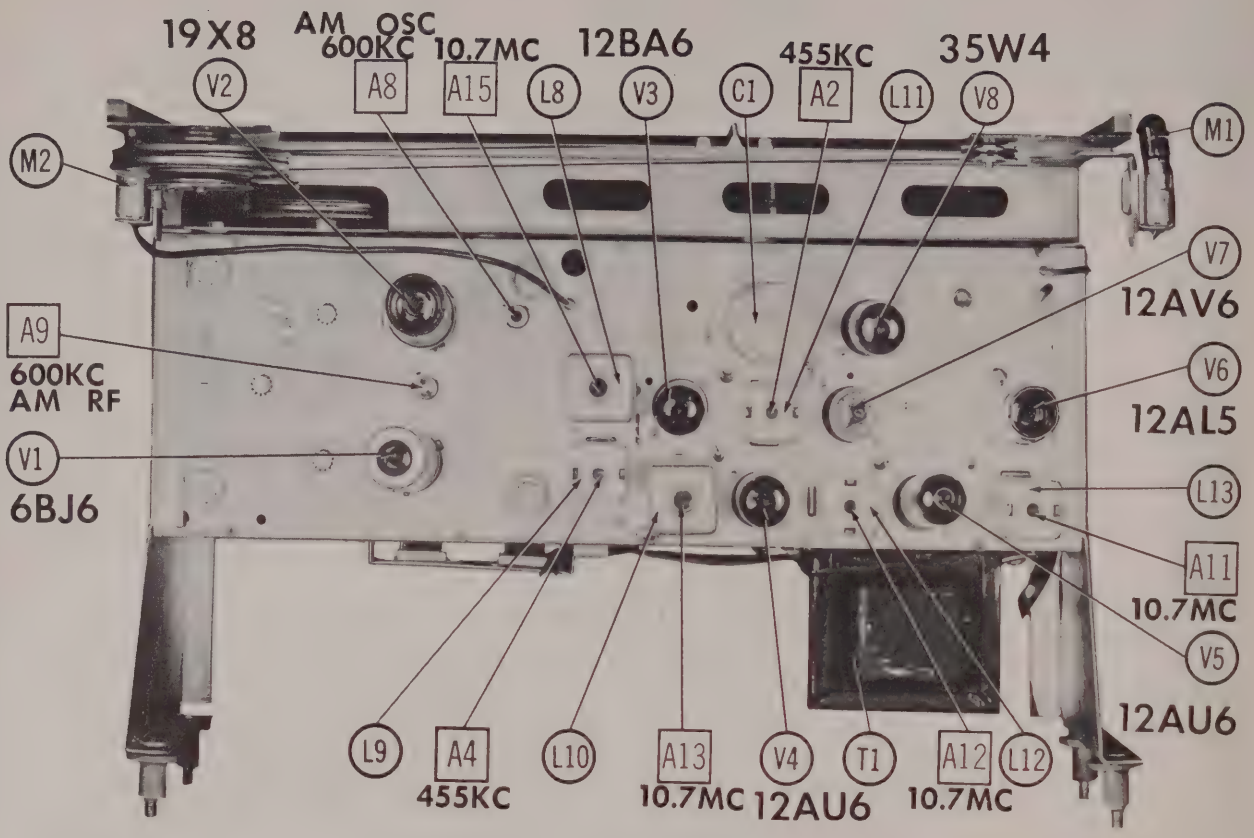
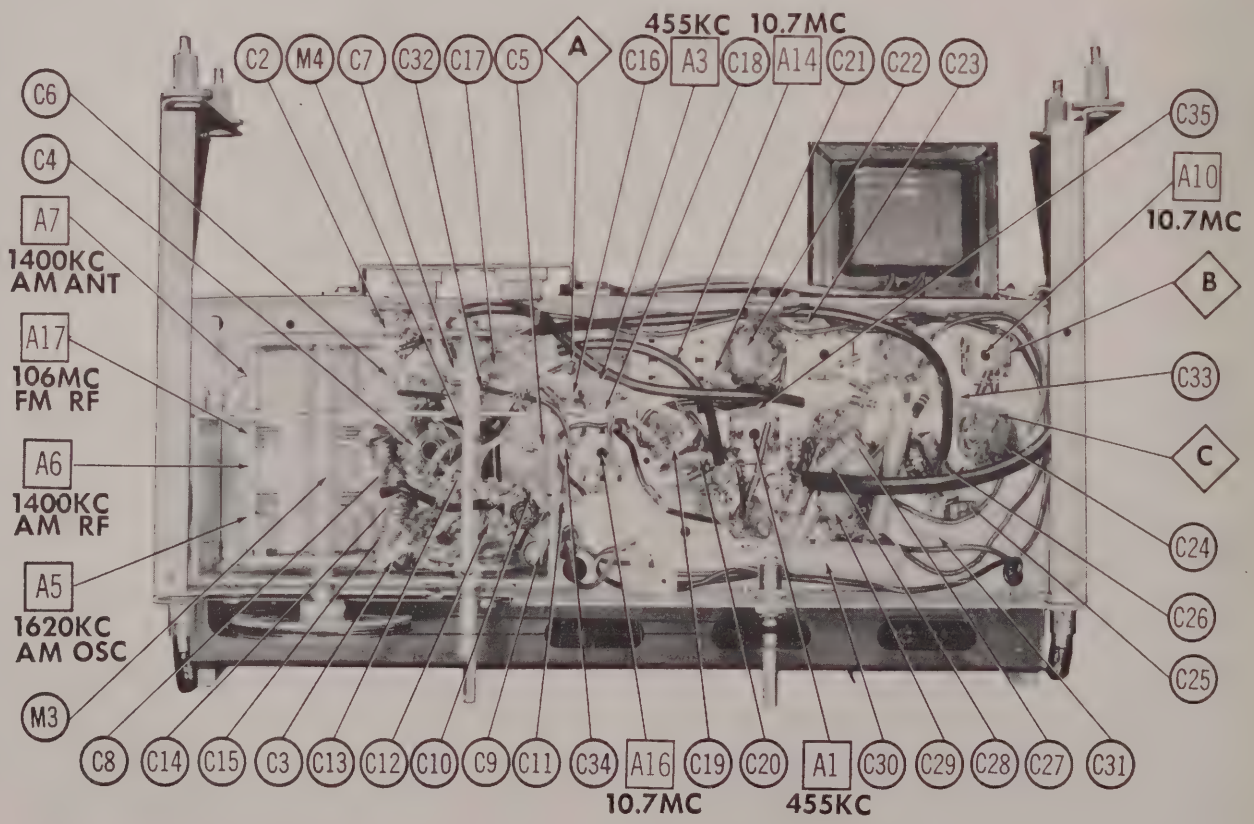


CHASSIS TOP VIEW— INDUCTOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A4..... GENERAL CEMENT #5097, 8727
A5, A6, A7, A17..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A13, A14, A15, A16.... GENERAL CEMENT #5009, 8195, 8274, 8275, 8282, 8728, 8987, 8988
WALSCO #2515, 2531, 2532
A9.....GENERAL CEMENT #5003, 8721, 8722
WALSCO #2512, 2519, 2525

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 12BA6 (V3). Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to point (A). Low side to chassis.	"	"	"	"	A3, A4	"
3.		Loop	1620KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	"	Tune to 1400KC signal		A6, A7	"
5.		"	600KC	"	Tune to 600KC signal	"	A8, A9	Adjust for maximum output while rocking tuning gang. Repeat steps 4 & 5.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

When adjusting A13, A14, A15 or A16, parallel opposite winding of same transformer with 680Ω resistor.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01mfd	High side to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference at low end.	DC probe to point (B). Common to chassis.	A10	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	High side to pin 1 (grid) of 12AU6 (V4). Low side to chassis.	"	"	"	DC probe thru 220K to pin 1 (grid) of 12AU6 (V5). Common to chassis.	A12	Adjust for maximum deflection.
9.	"	High side to pin 1 (grid) of 12BA6 (V3). Low side to chassis.	"	"	"	"	A13, A14	Adjust for maximum deflection. (See Note)
10.	"	High side to FM RF stator lug of tuning gang. Low side to chassis.	"	"	"	"	A15, A16	Adjust for maximum deflection. (See Note)

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01mfd	High side to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (C). Low side to chassis.	A10, A11	Adjust A11 so that 10.7MC marker occurs at center of crossover lines similar to Fig. 1. Adjust A10 for maximum amplitude and straightness of crossover lines.
7.	"	High side to pin 7 (grid) of 19X8 (V2). Low side to chassis.	"	"	"	Vert. Amp. thru 220K to pin 1 (grid) of 12AU6 (V5). Low side to chassis.	A12, A13, A14, A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	Across antenna terminals with 270Ω in high side.	87MC (Unmod.)	FM	Tuning gang fully closed	DC probe thru 220K to pin 1 of V5. Common to chassis.	L4	Adjust for maximum deflection by compressing or expanding coil turns.
12.	"	"	106MC	"	106MC signal	"	A17	Adjust for maximum deflection.
13.	"	"	90MC	"	90MC signal	"	L3	Adjust for maximum deflection by compressing or expanding coil turns.
14.	"	"	100MC	"	100MC signal	"	L1	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 11 thru 14.

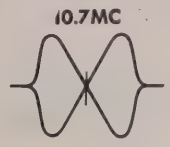


FIG. 1

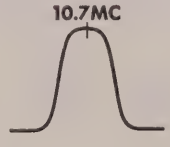
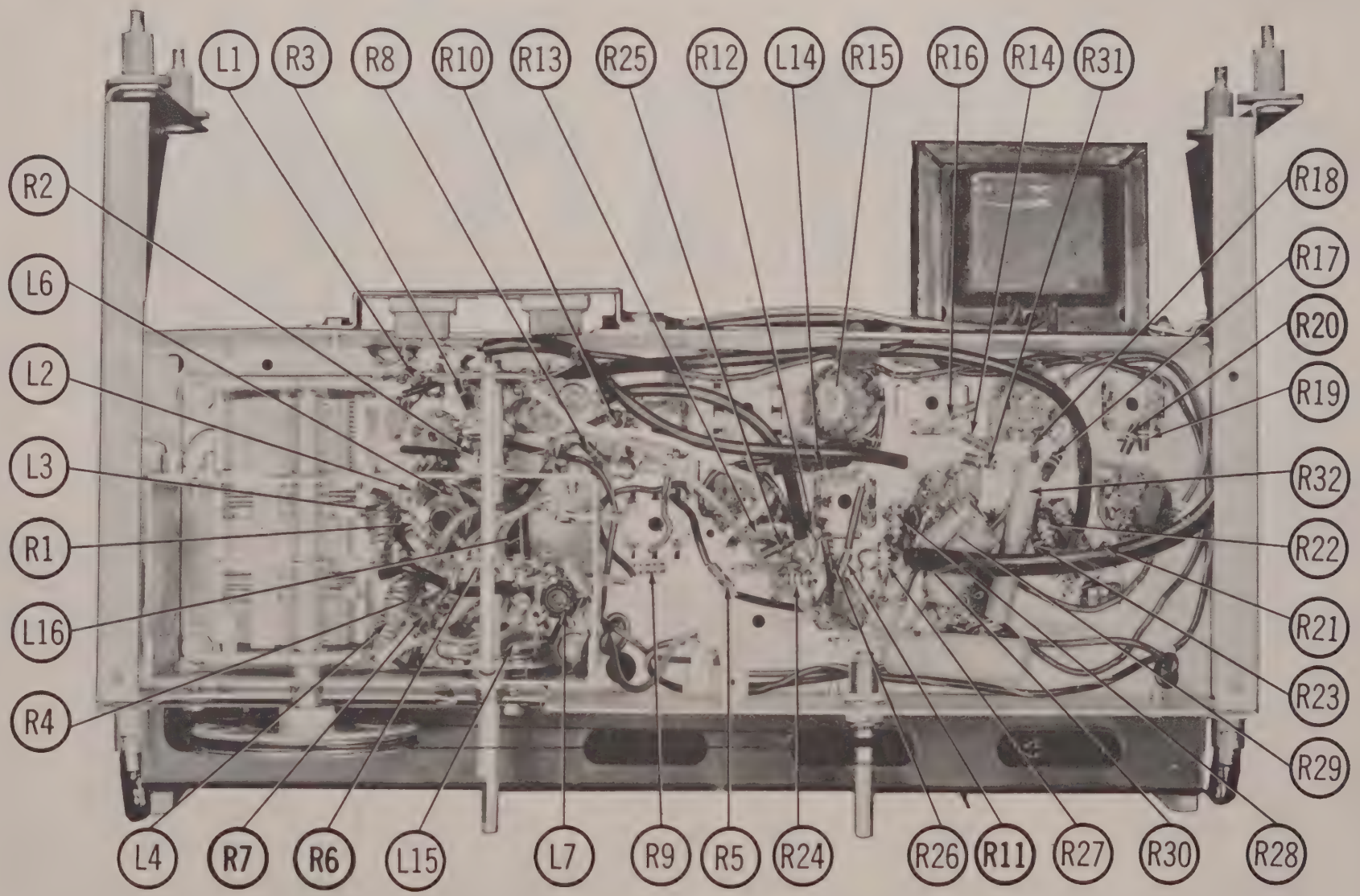
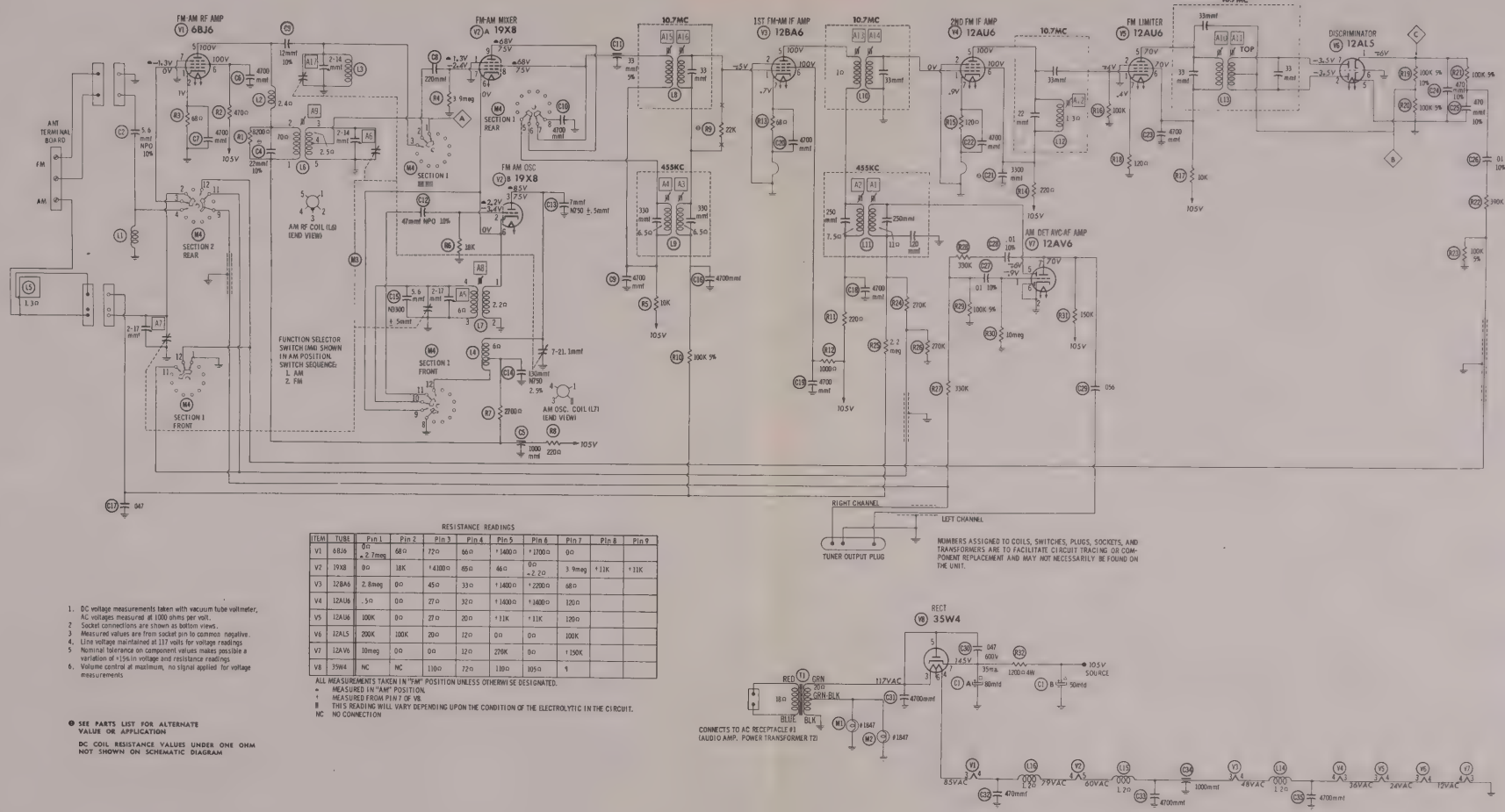


FIG. 2



TUNER CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BJ6	0Ω ≈ 2.7meg	68Ω	72Ω	66Ω	†1400Ω	†1700Ω	0Ω		
V2	19X8	0Ω	18K	†4100Ω	65Ω	46Ω	0Ω ≈ 2.2Ω	3.9meg	†11K	†11K
V3	12BA6	2.8meg	0Ω	45Ω	33Ω	†1400Ω	†2200Ω	68Ω		
V4	12AU6	.5Ω	0Ω	27Ω	32Ω	†1400Ω	†1400Ω	120Ω		
V5	12AU6	100K	0Ω	27Ω	20Ω	†11K	†11K	120Ω		
V6	12AL5	200K	100K	20Ω	12Ω	0Ω	0Ω	100K		
V7	12AV6	10meg	0Ω	0Ω	12Ω	270K	0Ω	†150K		
V8	35W4	NC	NC	110Ω	72Ω	110Ω	105Ω	¶		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
* MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 7 OF V8.
‖ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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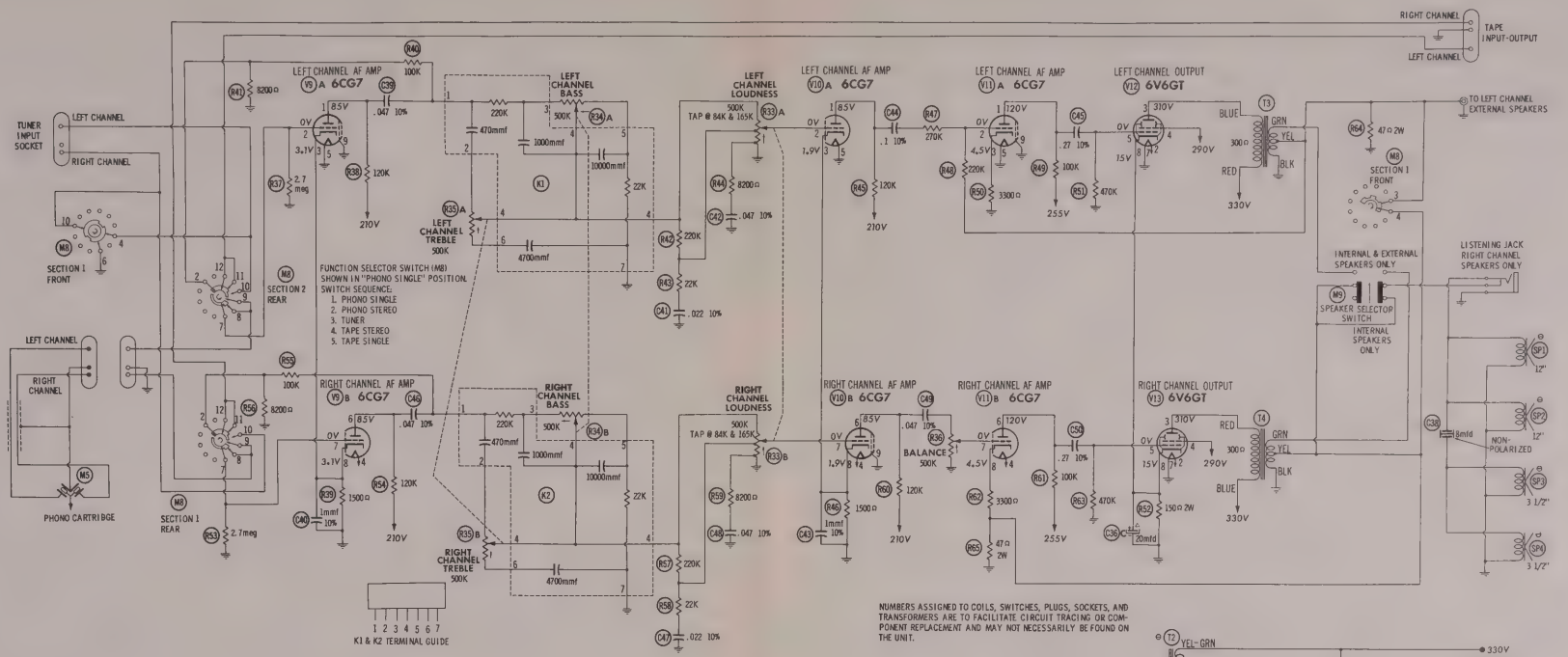
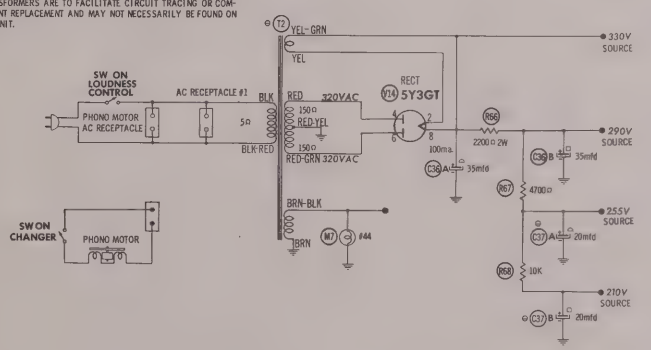
RCA VICTOR MODELS SHC7, SHC8, A, SHP7, SHP8, SHP11, 9T2 (Ch. RC-1155AX, RC-1155B, RS-171, RS-171A)

TUNER SCHEMATIC



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V9	6CG7	††135K	2.7meg	1500Ω	.1Ω	0Ω	††135K	2.7meg	1500Ω	0Ω
V10	6CG7	††135K	0Ω	1500Ω	.1Ω	0Ω	††135K	0Ω	1500Ω	0Ω
V11	6CG7	††110K	220K	3300Ω	.1Ω	0Ω	††110K	500K	3300Ω	0Ω
V12	6V6GT	NC	.1Ω	††300Ω	††2200Ω	470K	NC	0Ω	150Ω	
V13	6V6GT	TP	.1Ω	††300Ω	††2200Ω	470K	NC	0Ω	150Ω	
V14	5Y3GT	NC	¶	NC	150Ω	NC	150Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
†† MEASURED FROM PIN 8 OF V14.
NC NO CONNECTION
TP TIE POINT

RCA VICTOR MODELS SHC7, SHC8, A, SHP7, SHP8, SHP11, 9T2 (Ch. RC-1155AX, RC-1155B, RS-171, RS-171A)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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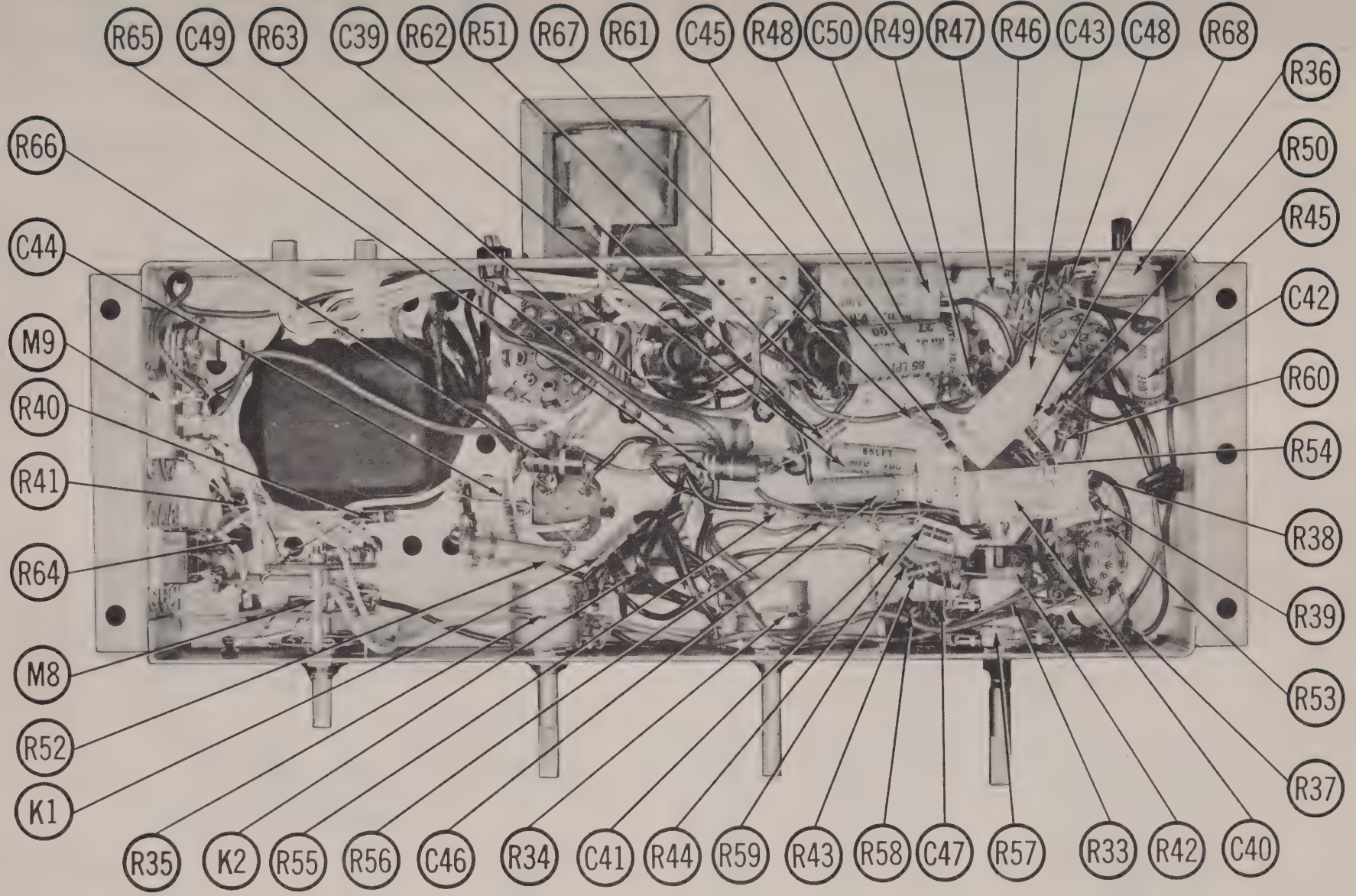


AMP CHASSIS - BOTTOM VIEW

MODEL SHC7
RCA VICTOR

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amplifier	6BJ6	
V2	FM AM Mixer-FM AM Osc.	19X8	
V3	1st FM-AM IF Amplifier	12BA6	
V4	2nd FM IF Amplifier	12AU6	
V5	FM Limiter	12AU6	
V6	Discriminator	12AL5	
V7	AM Det.-AVC-AF Amp.	12AV6	
V8	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	73520	AFH2-19	XB0181	FP216	TMD-17	TVL-2442.1	
B	▲50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	5.6		NPO 10%	74182						
C3	12		5%	70595		TCZ-12		CNO-412	5GA-Q12	
C4	22		10%	101940	NPO-SI 22	D6-220	CTA6Q22C	CNO-422	5TCC-Q22	①
C5	1000			105660	EF-001	MFT-1000			503C-D1	
C6	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C7	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C8	220			101374	1468-00022	DD-221	5W5T22	B-322	1FM-322	
C9	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C10	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C11	33		5%	100150						
C12	47		NPO 10%	77531	NPO-SI 47	TCZ-47	C10Q47C	CNO-447	5TCC-Q47	
C13	7		N75 ±.5mmf	77530						
C14	130		N750 2½%	77532						
C15	5.6		N3300 ±.5mmf	103440						
C16	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C17	.047	200		73558	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C18	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C19	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C20	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C21	3300			104205	BPD-0033	DD-332	BYA10D33	B-233	5HK-D33	②
C22	4700			73473	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C23	4700			73473	BPD-0047	DD-472	BYA10D47	B-247	5HK-D47	
C24	470		10%	76992	1469-00047	MD-471	5R5T47	B-347	MS-347	
C25	470		10%	76992	1469-00047	MD-471	5R5T47	B-347	MS-347	
C26	.01	200	10%	79316				GEM-1611	2WF-S1	
C27	.01	200	10%	101000				GEM-1611	2WF-S1	
C28	.01	400	10%	106185				GEM-1611	5BF-S1	
C29	.056	400		103269A				GEM-6156		
C30	.047	600		73592	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C31	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C32	470			76992	1468-00047	DD-471	5W5T47	B-347	1FM-347	
C33	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	
C34	1000			105660	EF-001	MFT-1000			503C-D1	
C35	4700			73473	BPD-0047	DD-472	BYA10D47M	B-247	5HK-D47	

① Some versions may use 47mmf in this application (Part #77531).
② Some versions may use 4700mmf in this application (Part #73473).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R1	8200Ω		502282	
R2	470Ω		502147	
R3	68Ω		502068	
R4	3.9meg		502539	
R5	10K		502310	
R6	18K		502318	
R7	2700Ω		502227	
R8	220Ω		502122	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R9	22K		502322	Note 1
R10	100K 5%		502410	
R11	220Ω		502122	
R12	1000Ω		502210	
R13	68Ω		502068	
R14	220Ω		502122	
R15	120Ω		502112	
R16	100K		502410	
R17	10K		502310	
R18	120Ω		502112	
R19	100K 5%		502410	
R20	100K 5%		502410	
R21	100K 5%		502410	
R22	390K		502439	
R23	100K 5%		502410	
R24	270K		502427	
R25	2.2meg		502522	
R26	270K		502427	
R27	330K		502433	
R28	330K		502433	
R29	100K 5%		502410	
R30	10meg		502610	
R31	150K		502415	
R32	1200Ω	4	76346	

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil	77538					
L2	RF Choke	77534	19-1006		4624		15.2 Microhenries
L3	FM RF Coil	77536					
L4	FM Osc. Coil	77537					
L5	Loop Antenna	101363					
L6	AM RF Coil	77525	14-1076				
L7	AM Osc. Coil	77526	14-1077		71-Osc.		
L8	1st FM IF	100112	16-3471				
L9	1st AM IF	76335	16-6758	BC-352	12-C1	RF-1	
L10	2nd FM IF	77513	16-3472				
L11	2nd AM IF	76328	16-6770	BC-355	12-C6		
L12	3rd FM IF	77512					
L13	Discriminator	77511	17-3494	FM-253	1464		
L14	Fil. Choke	77535	19-1005	BC-566	4612		11 Microhenries
L15	Fil. Choke	77535	19-1005	BC-566	4612		11 Microhenries
L16	Fil. Choke	77535	19-1005	BC-566	4612		11 Microhenries

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .33A	120V ② .185A Tap ② 6V ② .4A		104609						

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Lamp		#1847
M2	Lamp		#1847
M3	Tuning Cap.	105328	5 Gang (AM Sections: Ant. 14.5-234.5mmf, RF 12-238.2mmf, Osc. 8-152mmf)
M4	Switch	104608	Function Selector (2 Position, Rotary, Wafer Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V9	Left Channel AF Amp.		
	Right Channel AF Amp.	6CG7	
V10	Left Channel AF Amp.		
	Right Channel AF Amp.	6CG7	

ITEM No.	USE	TYPE	NOTES
V11	Left Channel AF Amp.		
	Right Channel AF Amp.	6CG7	
V12	Left Channel Output	6V6GT	
V13	Right Channel Output	6V6GT	
V14	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C36A	▲35	400	105765	AFH3-133	C1070	FP346	TMT-133	TVL-3744	
B	■35	400							
C	▲20	25							
C37A	▲20	400	①	AFH4-57	D0520	FP426	TMQ-83	* TVLS-4712.1	
B	■20	400							
C	▲20	25	①						
D	20	25	①						
C38	8	10AC	100509	AC-PRS10V8	BBR16-90† BBR16-90	TCN108	TD-16-150† TD-16-150	* TVAS-1112	

① C37C and C37D are not used (C37 Part #106210). † Connect negative leads together.
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

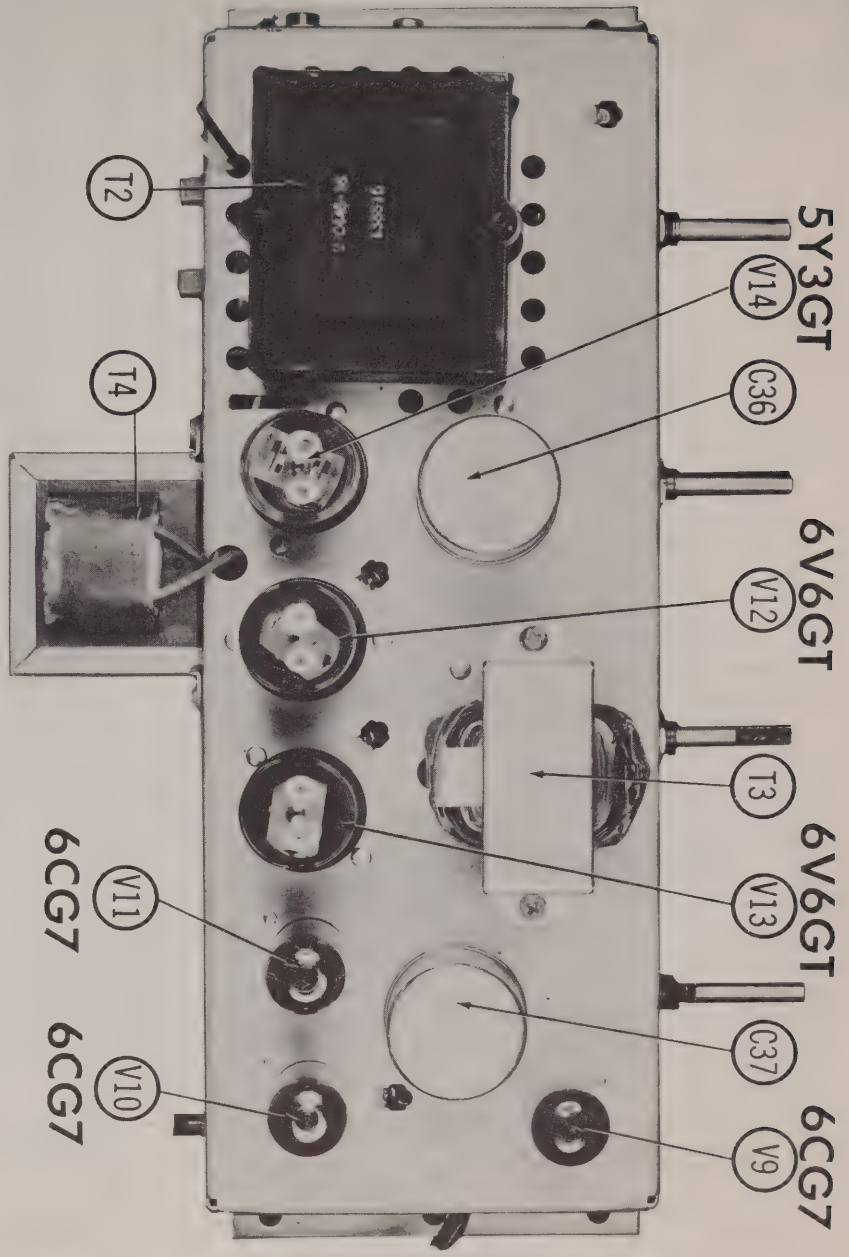
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C39	.047	400	10%	105240					5BF-S47	
C40	1.0	50	10%	106772				GEM-21	2WF-M1	
C41	.022	200	10%	79343					2WF-S22	
C42	.047	200	10%	105578					2WF-S47	
C43	1.0	50	10%	106772				GEM-21	2WF-M1	
C44	.1	400	10%	78922					5BF-P10	
C45	.27	400	10%	78571				GEM-6027	5BF-P27	
C46	.047	400	10%	105240					5BF-S47	
C47	.022	200	10%	79343					2WF-S22	
C48	.047	200	10%	105578					2WF-S47	
C49	.047	400	10%	105240					5BF-S47	
C50	.27	400	10%	78571				GEM-6027	5BF-P27	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R33A	500K	½	106537					Loudness, Tap ② 84K & 165K
B	500K	½						Loudness, Tap ② 84K & 165K
C	Switch							Push-Pull
R34A	500K	½	106214	BB-104	AD47-500K-Z	Q13-133		Bass, Left Channel
B	500K	½		Not Req.	Not Req.	M13-133		Bass, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R35A	500K	½	106213	BB-1041		Q11-133		Treble, Left Channel
B	500K	½		Not Req.		M11-133		Treble, Right Channel
R36A	500K	½	106212	AB-60	B47-500K-Z	B13-133	TA55A	Balance
B	Shaft			AK-1	Not Req.	TM2	Not Req.	

AMP CHASSIS-TOP VIEW



RCA VICTOR MODELS SHC7, SHC8, A, SHP7, SHP8, SHP11, 972 (Ch. RC-1155AX, RC-1155B, RS-171, RS-171A)

AMP PARTS LIST & DESCRIPTION (continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R37	2.7meg		502527	
R38	120K		502412	
R39	1500Ω		502215	
R40	100K		502410	
R41	8200Ω		502282	
R42	220K		502422	
R43	22K		502322	
R44	8200Ω		502282	
R45	120K		502412	
R46	1500Ω		502215	
R47	270K		502427	
R48	220K		502422	
R49	100K		502410	
R50	3300Ω		502233	
R51	470K		502447	
R52	150Ω	2	522115	
R53	2.7meg		502527	
R54	120K		502412	
R55	100K		502410	
R56	8200Ω		502282	
R57	220K		502422	
R58	22K		502322	
R59	8200Ω		502282	
R60	120K		502412	
R61	100K		502410	
R62	3300Ω		502233	
R63	470K		502447	
R64	47Ω	2	522047	
R65	47Ω	2	522047	
R66	2200Ω	2	522222	
R67	4700Ω		502247	
R68	10K		502310	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V @ .7A	620VCT @ .100A	5V @ 2A	106216 ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.7A									

① Part #106458 used in Model SHP11.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6800Ω	16Ω Tap @ 8Ω	106211	Z1112	A-2902①	AU-609	A-3870	24S55	S-55X	① Drill new mounting hole.
T4	6800Ω	16Ω Tap @ 8Ω	106211	Z1112	A-2902①	AU-609	A-3870	24S55	S-55X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	RCA Victor PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	100897 ①	12A10PA	① Used in Models SHC7, SHC8, SHC8A, SHP7, SHP8
SP2	12"	PM	6-8Ω	100897 ①	12A10PA	② Used in Model SHP11 (SHS11 Speaker Cabinet for Model SHP11)
	8"	PM	3-4Ω	78597 ②	8A21	
SP3	3½"	PM	6-8Ω	105395 ①②	3A15TZ6.4	
SP4	3½"	PM	6-8Ω	105395 ①②	3A15TZ6.4	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K1	Audio Circuit (Left Channel)	470mmf, 1000mmf, 4700mmf, 10000mmf, 22K, 220K	106457	
K2	Audio Circuit (Right Channel)	470mmf, 1000mmf, 4700mmf, 10000mmf, 22K, 220K	106457	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M5	106770 ①	13-TB				① Part #106771 used in Model SHP-11

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M6				

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M7	Lamp		#44
M8	Switch	106209	Function Selector (5 Position, Rotary, Wafer Type)
M9	Switch	46760	Speaker Selector (DPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	104798	Tuning, Models 9T2, SHC8, SHC8A, SHP8, SHC7
Knob	104536	Volume-On-Off, Models 9T2, SHC8, SHC8A, SHP8, SHC7
Knob	104127	Bass, Treble, Models 9T2, SHC8, SHC8A, SHP8, SHC7, SHP7
Knob	104123	Bass, Treble, Model SHP11
Knob	106446	Audio Function, Model 9T2, SHC8, SHC8A, SHP8, SHC7, SHP7
Knob	106640	Audio Function, Model SHP11
Knob	104797	AM-FM Function, Models 9T2, SHC8, SHC8A, SHP8
Knob	106666	Loudness, Models SHC7, SHP7
Knob	106667	Loudness, Model SHP11
Cabinet	X4189	Mahogany Models SHC8, SHC8A, SHP8
Cabinet	X4191	Maple, Models SHC8, SHC8A, SHP8
Cabinet	X4282	Walnut, Models SHC8, SHC8A, SHP8
Cabinet	X4428	Cherry Bisque, Models SHC7, SHP7
Cabinet	X4427	Mahogany, Models SHC7, SHP7
Cabinet	X4433	Maple, Models SHC7, SHP7
Cabinet	X4448	Ebony, Less Legs, Model SHP11
Cabinet	X4434	Mahogany, Less Legs, Model SHP11
Cabinet	X4435	Oak, Less Legs, Model SHP11
Cabinet	X4492	Walnut, Less Legs, Model SHP11
Legs	Y7025	4 used, For Ebony Cabinet, Model SHP11
Legs	Y7023	4 used, For Mahogany Cabinet, Model SHP11
Legs	Y7024	4 used, For Oak Cabinet, Model SHP11
Legs	Y7027	4 used, For Walnut Cabinet, Model SHP11
Lid	X3797	Mahogany, Models SHC8, SHC8A, SHP8
Lid	X3799	Maple, Models SHC8, SHC8A, SHP8
Lid	X3798	Oak, Models SHC8, SHC8A, SHP8
Lid	X3919	Walnut, Models SHC8, SHC8A, SHP8
Lid	X3974	Cherry Bisque, Models SHC7, SHP7
Lid	X3973	Mahogany, Models SHC7, SHP7
Lid	X3975	Maple, Models SHC7, SHP7
Lid	X5022	Ebony, Model SHP11
Lid	X3981	Mahogany, Model SHP11
Lid	X3982	Oak, Model SHP11
Lid	X3983	Walnut, Model SHP11
Dial Pointer	104605	
Tuning Dial	104610	
Window	104540	For Interior Light

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RHEIN MODEL 106

RHEIN MODEL 106

RHEIN MODEL 106

TRADE NAME	Rhein Model 106		
MANUFACTURER	Rhein Sound Systems, Inc., 133 Hamilton St., New Haven 5, Conn.		
TYPE SET	AC Operated 2 Channel Audio Amplifier		
TUBES	Five		
POWER SUPPLY	110-120 Volts AC, 50-60 Cycles	RATING	67 Watts, . 65 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic Preamp. - AF Amp.	6SL7GT	
V2	AF Amp. - Phase Inv.	6SL7GT	
V3	Output	6V6GT	

ITEM No.	USE	TYPE	NOTES
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RHEIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	450	EYT-1185	AFH3-139	C1030	FP237	TMT-139	T-705	TVL-3753.6
B	■30	450				TC48			
C	▲40	50							
C2A	▲10	450	EYD-565	AFH2-47	B0370	FP231	TMD-47	D-200	TVL-2750
B	■10	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RHEIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	400	330411	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C4	.01	400	330411	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C5	.022	400	3304122	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C6	.005	400	330425	P488N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C7	250		GP2K250	SI 250	D6-251	LT6T25	UC-5325	5GA-T25	
C8	.022	400	3304122	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C9	.022	400	3304122	P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C10	.047	400	3304174	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RHEIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	3-12	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	500K	½	3-13	B-59	A47-500K-S	Q11-133	U48	Phono
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	3-13	B-59	A47-500K-S	Q11-133	U48	Microphone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

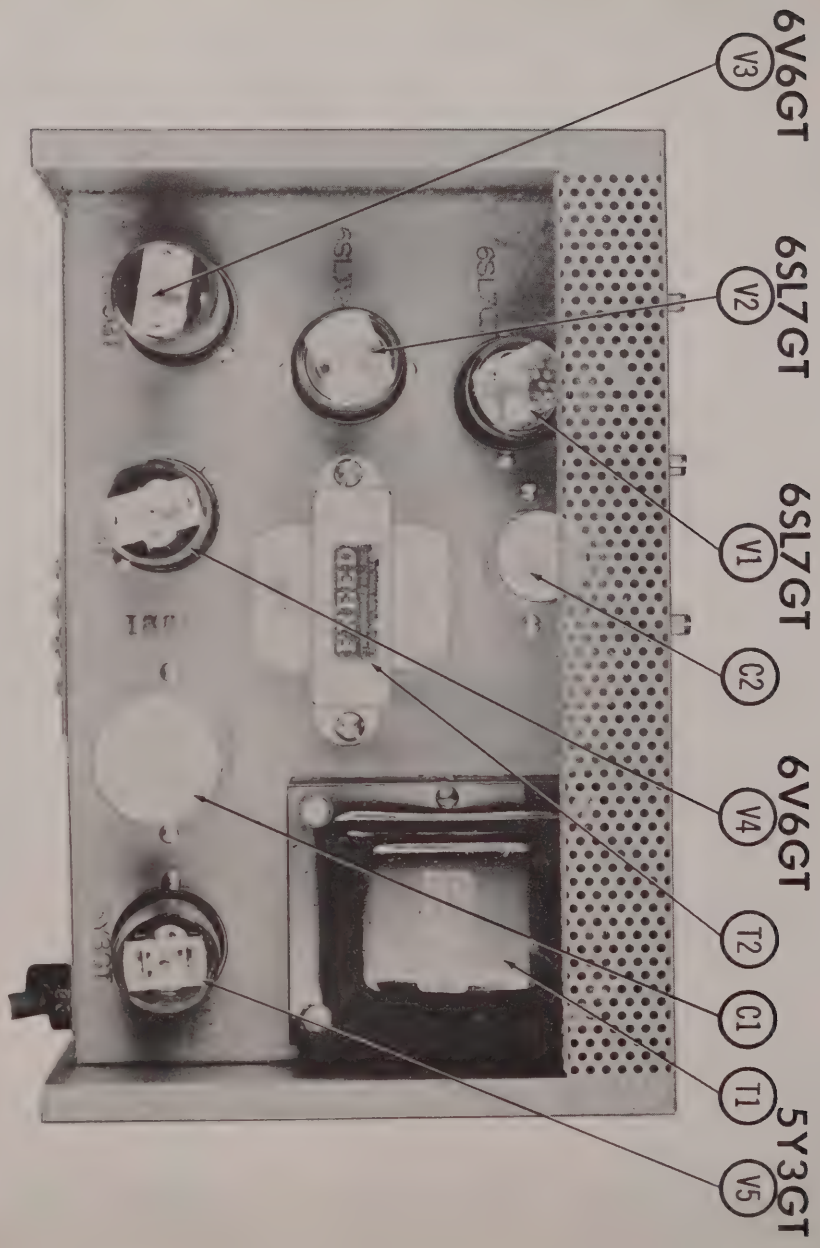
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		RHEIN PART No.	NOTES
	OHMS	WATT		
R4	2.2meg			
R5	270K			
R6	470K			
R7	470K			
R8	470K			
R9	100K			
R10	2200Ω			
R11	270K			
R12	270K			
R13	2200Ω			
R14	5600Ω			

ITEM No.	RATING		RHEIN PART No.	NOTES
	OHMS	WATT		
R15	270K			
R16	2200Ω			
R17	100K			
R18	15K			
R19	100K			
R20	12K	1		
R21	200Ω	5		
R22	100K			
R23	2500Ω			
R24	10Ω			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RHEIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .65A	620VCT @ .085A	5V @ 2A	30824	P9305				22K04	R-9B
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 1.5A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RHEIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4300Ω CT	16Ω Tap @ 8Ω, 4Ω	30825	Z1011	A-2904 ①	AU-609	A-3870	22S62	S-55X	① Drill new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RHEIN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	½A 250V			31201.5 (3AG ½A 250V)	342001	AGC ½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	RHEIN PART No.	NOTES
M2	Lamp		#47

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

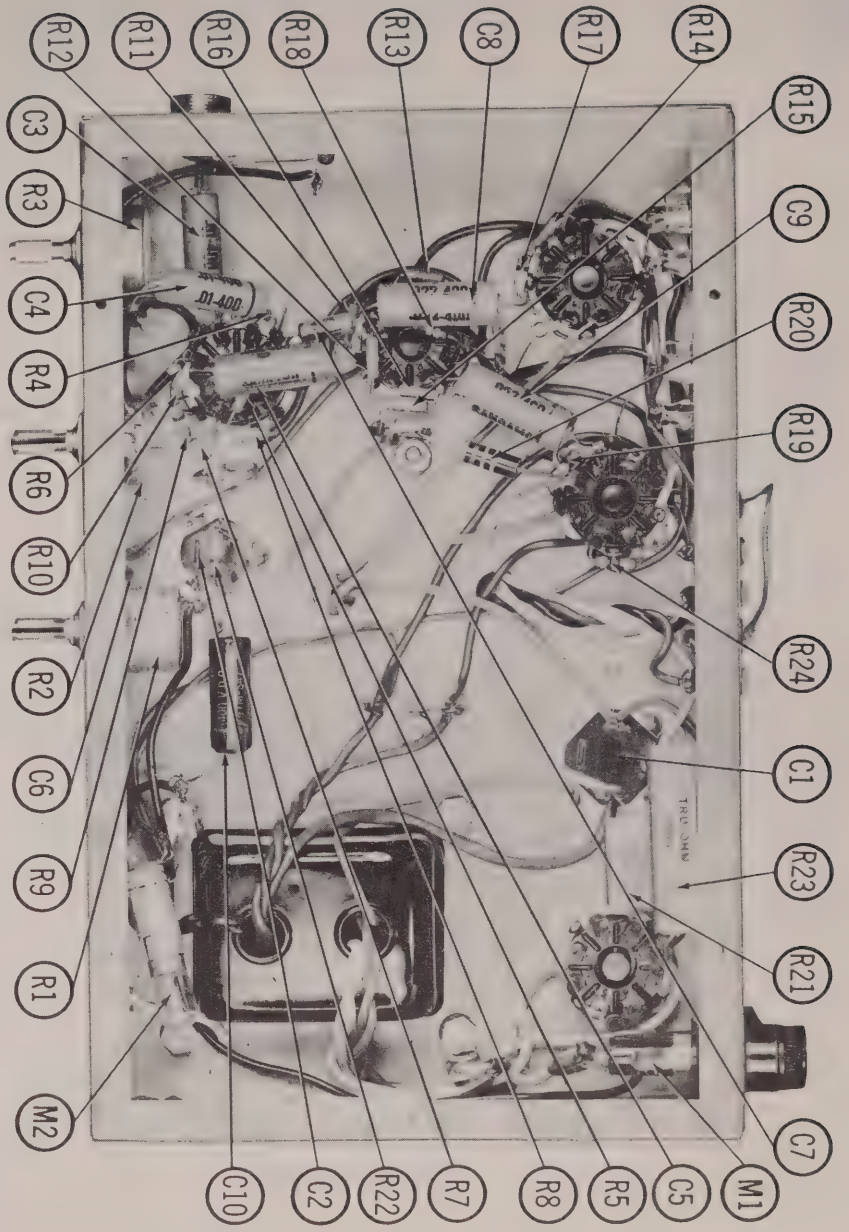
NAME	PART NO.	DESCRIPTION
Cover Bottom Plate	C-131 C-132	

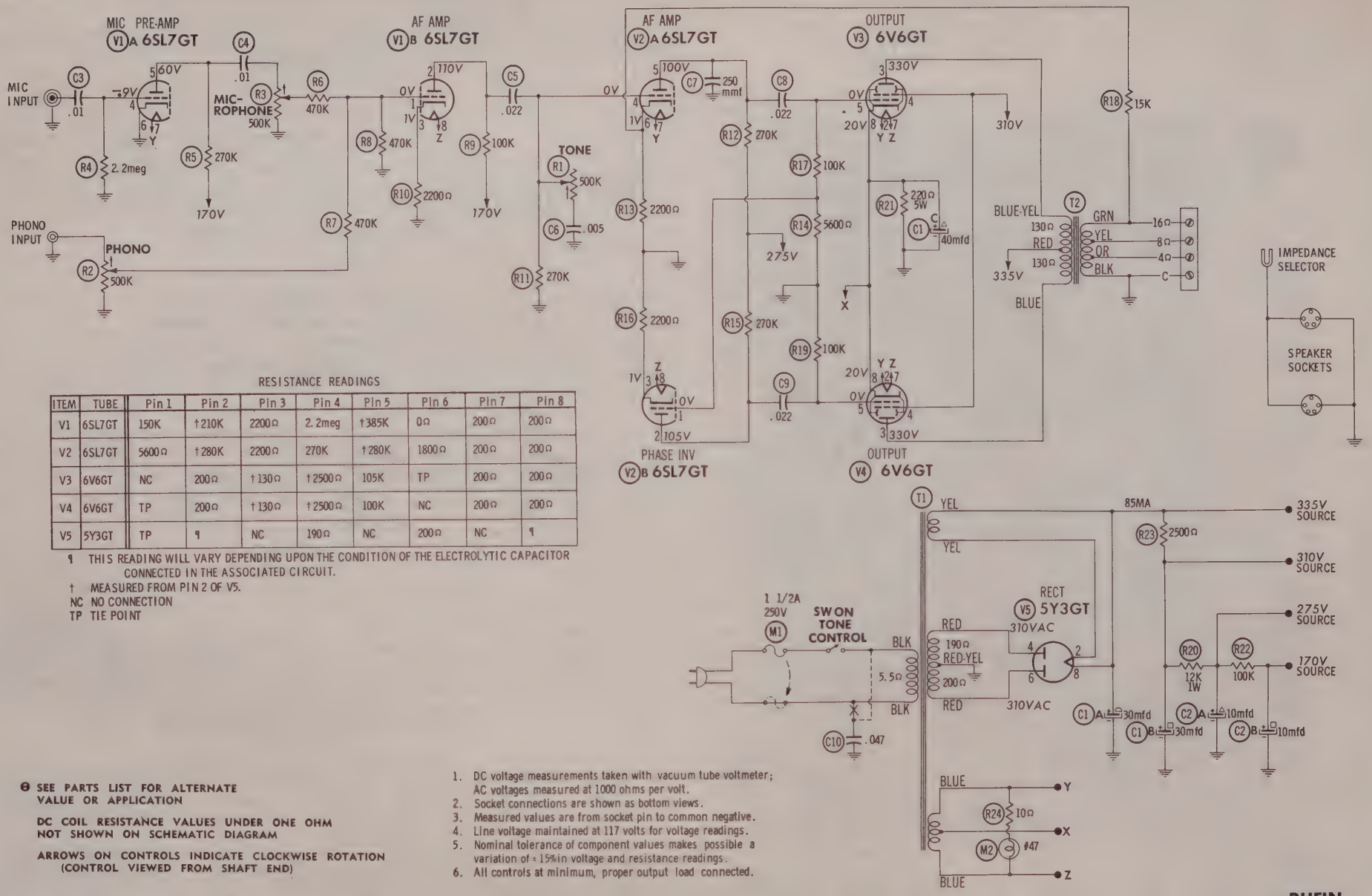
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6SL7GT	150K	†210K	2200Ω	2.2meg	†385K	0Ω	200Ω	200Ω
V2	6SL7GT	5600Ω	†280K	2200Ω	270K	†280K	1800Ω	200Ω	200Ω
V3	6V6GT	NC	200Ω	†130Ω	†2500Ω	105K	TP	200Ω	200Ω
V4	6V6GT	TP	200Ω	†130Ω	†2500Ω	100K	NC	200Ω	200Ω
V5	5Y3GT	TP	¶	NC	190Ω	NC	200Ω	NC	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

† MEASURED FROM PIN 2 OF V5.

NC NO CONNECTION

TP TIE POINT

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RHEIN MODEL 106

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 9055, 9056 (Ch. 528.53330)

SILVERTONE MODELS 9055, 9056 (Ch. 528.53330)

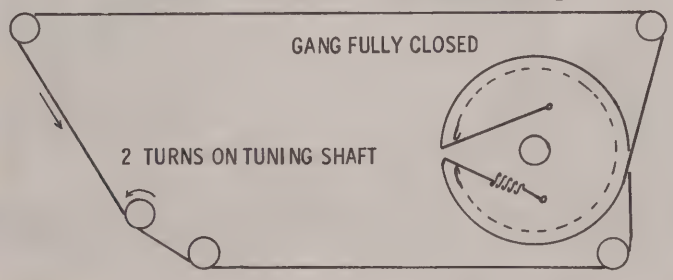
MODEL 9055

SILVERTONE MODELS 9055, 9056 (Ch. 528.53330)

TRADE NAME	Silvertone Models 9055, 9056 (Ch. 528.53330)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated FM-AM Receiver with 4 Speed Automatic Record Changer		
TUBES	Ten		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	100 Watts, .98 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 535 - 1650KC	FREQ. MOD.	88 - 108MC

RECORD CHANGER 528.56360 OR 528.56370

DIAL CORD STRINGING



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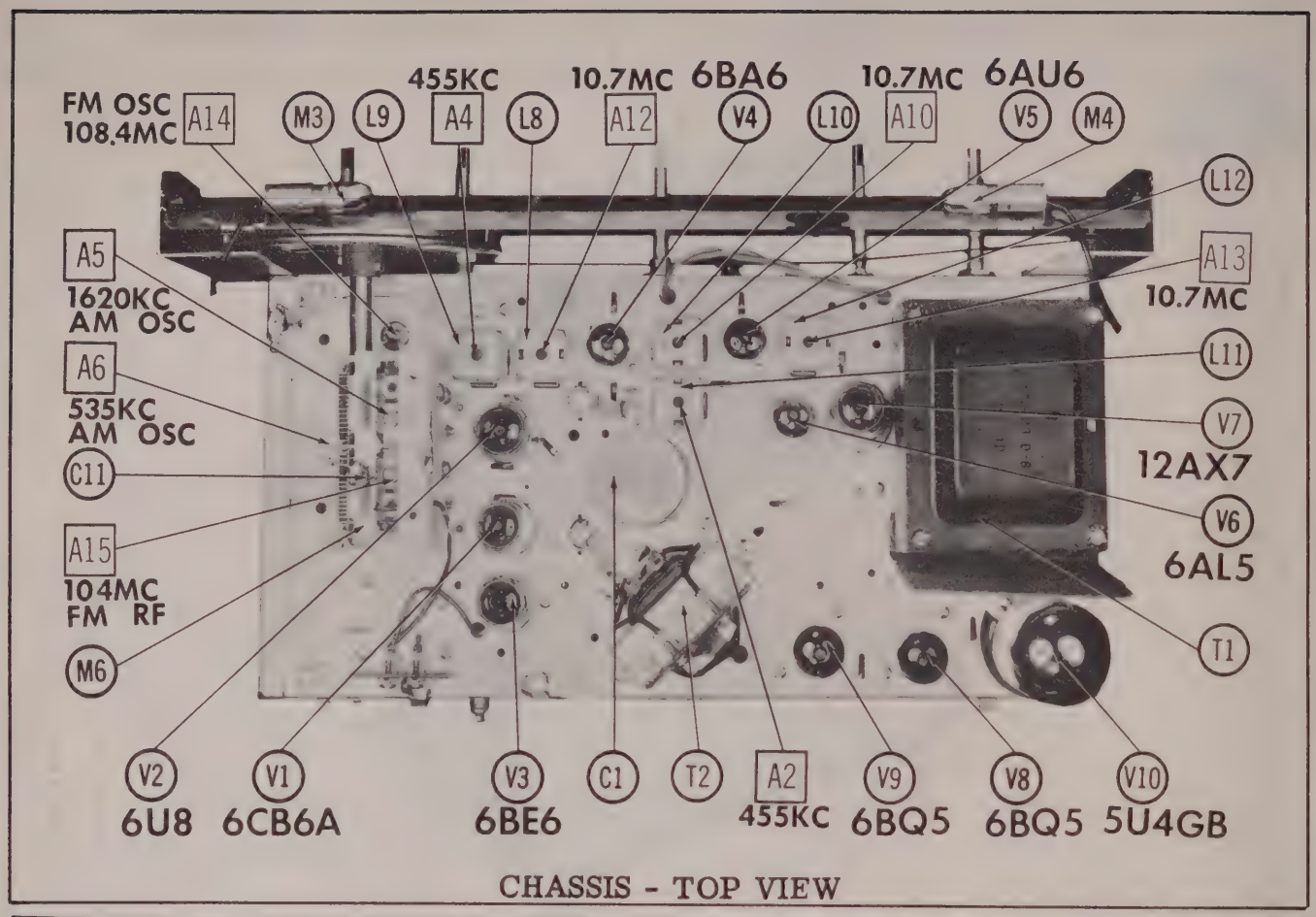
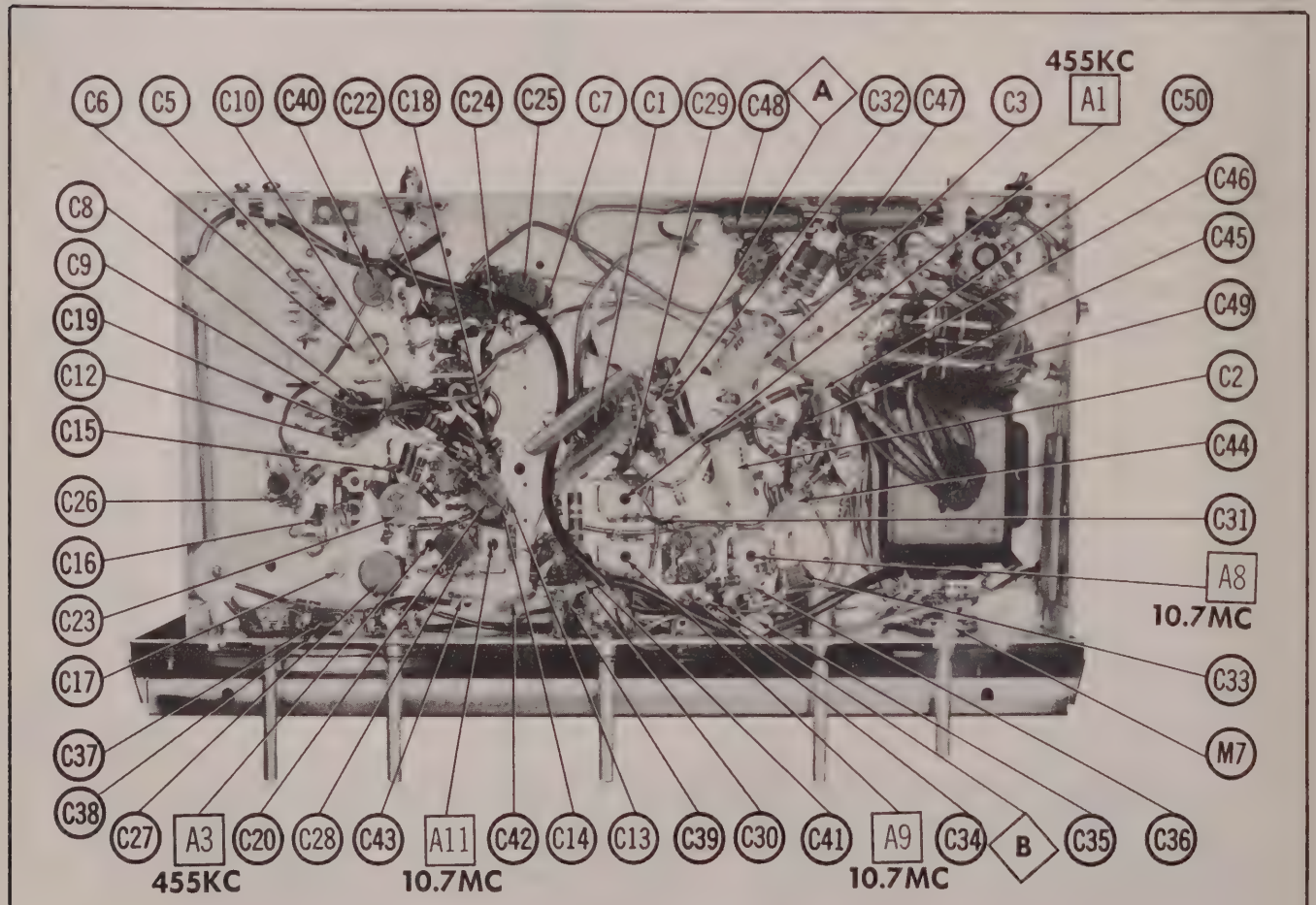


CHASSIS - TOP VIEW



CHASSIS BOTTOM VIEW - CAPACITOR & ALIGN IDENT

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	1620KC	"	A5	"
3.	"	"	535KC	"	535KC	"	A6	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.		Loop	1400KC	"	Tune to 1400KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.		High side to ungrounded tube shield of 6U8 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
6.		"	"	"	"	DC probe to point Ⓐ. Common to point Ⓑ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.		High side to ungrounded tube shield of 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.		"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A13	Reconnect C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	270Ω Carbon Resistor	Across FM antenna terminals with 270Ω in high side.	108.4MC (Unmod.)	FM	108.4MC	Across voice coil	A14	Adjust for maximum output.
8.	"	"	87.6MC	"	87.6MC	"	L4	Adjust for maximum output by compressing or expanding coil turns. Repeat steps 7 & 8.
9.	"	"	104MC	"	Tune to 104MC signal	"	A15	Adjust for maximum output.
10.	"	"	98MC	"	Tune to 98MC signal	"	L2	Adjust for maximum output by compressing or expanding coil turns.
11.	"	"	90MC	"	Tune to 90MC signal	"	L1	Adjust for maximum output by compressing or expanding coil turns.

FIG. 1

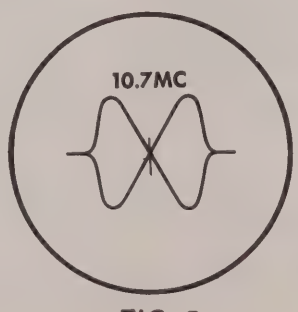
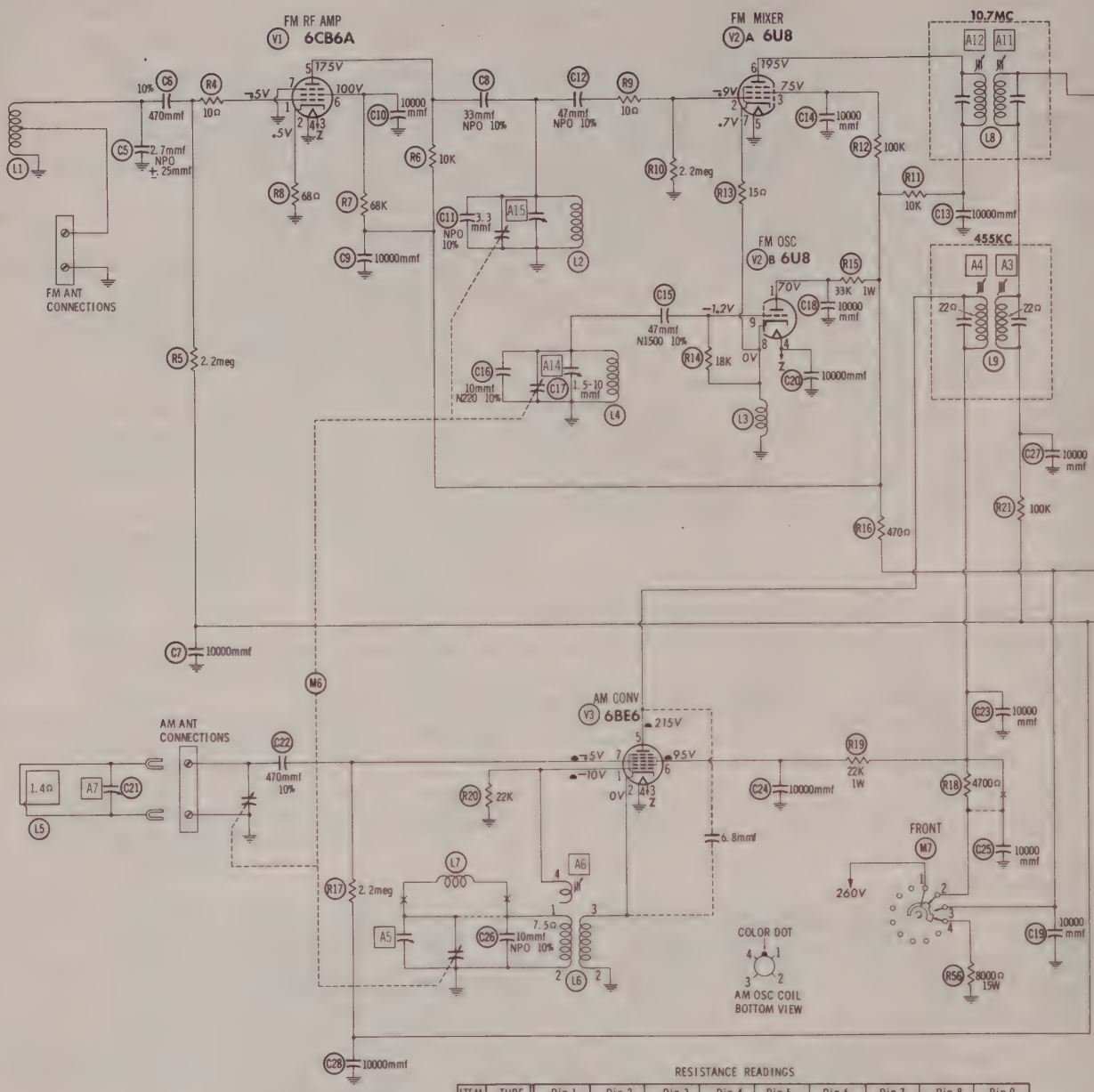


FIG. 2



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6A	2.5meg ≈4.8meg	68Ω	.1Ω	0Ω	†12K	†70K	0Ω		
V2	6U8	†35K	2.2meg	†100K	.1Ω	0Ω	†12K	15Ω	0Ω	18K
V3	6BE6	≈22K	.9Ω	.1Ω	0Ω	≈†6300Ω	≈†28K	≈4.8meg		
V4	6BA6	300K	0Ω	0Ω	.1Ω	†5500Ω	†83K	68Ω		
V5	6AU6	460K	0Ω	0Ω	.1Ω	†6300Ω	†57K	68Ω		
V6	6AL5	0Ω	13K	2Ω	.1Ω	INF	0Ω	INF		
V7	12AX7	†250K	220K	470K	0Ω	0Ω	†250K	1meg	470Ω	.1Ω
V8	6BQ5 EL84	440K	440K	135Ω	.1Ω	0Ω	NC	†200Ω	NC	†750Ω
V9	6BQ5 EL84	440K	440K	135Ω	.1Ω	0Ω	NC	†230Ω	NC	†750Ω
V10	5U4GB	NC	¶	NC	36Ω	NC	40Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V10.
≈ MEASURED IN "AM" POSITION.
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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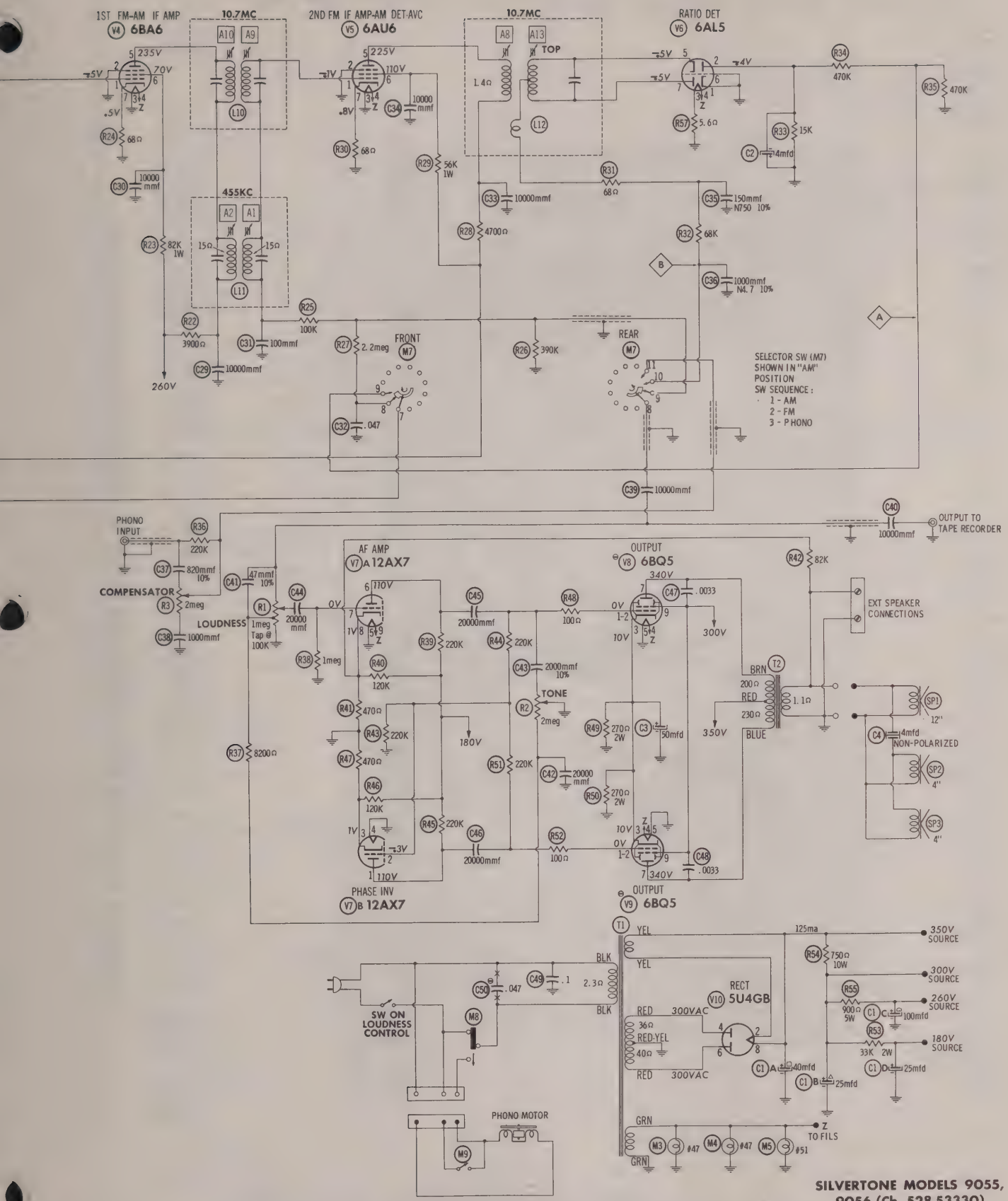
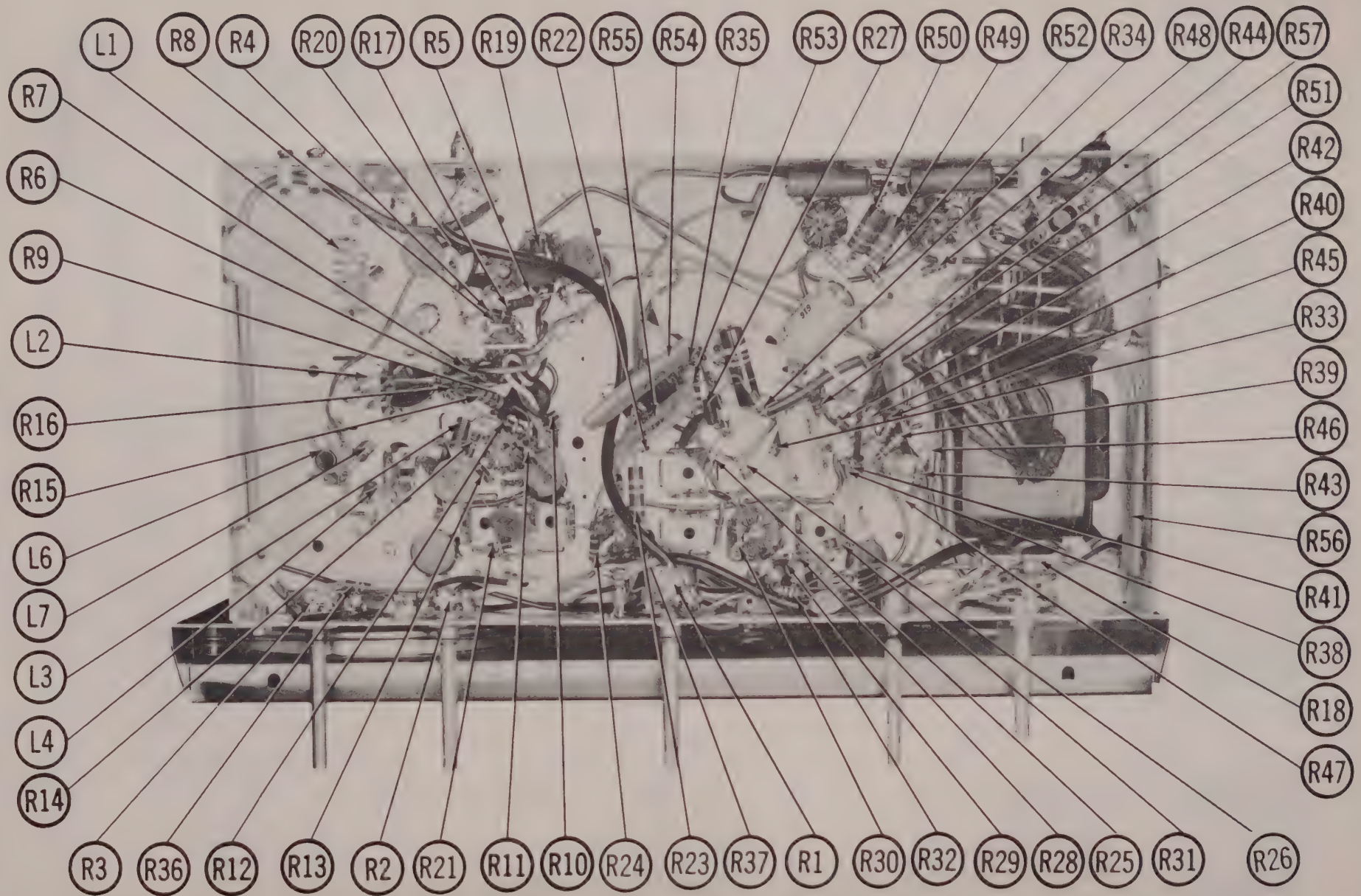


SILVERTONE MODELS 9055, 9056 (Ch. 528.53330)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CB6A	
V2	FM Mixer - FM Osc.	6U8	
V3	AM Converter	6BE6	
V4	1st FM - AM IF Amp.	6BA6	
V5	2nd FM IF Amp. - AM Det. - AVC	6AU6	
V6	Ratio Detector	6AL5	
V7	AF Amp. - Phase Inv.	12AX7	
V8	Output	6BQ5/EL84	
V9	Output	6BQ5/EL84	
V10	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	350	18-35-3	AFH4-58-75	D0044	FP447		Q-221.5	R2617 *
B	▲25	350			BR2035	TC68		MT-4530	
C	▲100	350							
D	25	350							
C2	4	50	18-25-0	PRS150V4	BBR4-50	TT50X4	TD-4-50	MT-0504	TVA-1402
C3	50	25	18-23-0	PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C4	4	150NP	18-9-5	NP-PRS450V4	BBR8-150 † BBR8-150 †	TCN510	TD-8-150 † TD-8-150 †	MT-1508 † MT-1508 †	R1251 *

* Not normally in distributors stock. Available thru distributor on order to manufacturer.
† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	2.7		15-279121						NPO ±.25mmf
C6	470		15-47111		MD-471		JL-347		10%
C7	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C8	33		15-330611	NPO-SI-33	TCZ-33	CTA6Q33C	CNO-433	5TCC-Q33	NPO 10%
C9	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C10	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C11	3.3		15-339131	NPO-DI 3.3	DTZ-3R3	CTA6V33C	CNO-533	5TCCB-V33	NPO 10%
C12	47		15-470611	NPO-SI 47	TCZ-47	CTA6Q47C	CNO-447	5TCC-Q47	NPO 10%
C13	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C14	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C15	47		15-470115						N1500 10%
C16	10		20-121-0						N220 10%
C17	1.5-10		19-2-5						
C18	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C19	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C20	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C21			19-165-0						
C22	470		15-47111		MD-471		JL-347		10%
C23	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C24	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C25	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C26	10		15-100614	NPO-SI 10	TCZ-10	CTA6QIC	ZT-541	5TCC-Q1	NPO 10%
C27	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C28	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C29	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C30	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C31	100		15-10116	BPD-0001	DD-101	L10T1	CNO-310	5GA-Q1	
C32	.047	200	16-47328	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C33	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C34	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C35	150		15-15111	N750-DI 150	DTN-750	CTA6T15U	CN7-315	5TCU-T15	N750 10%
C36	1000		15-10261						N4.7 10%
C37	820		15-82111				JL-382		10%
C38	1000		15-10211	BPD-001	DD-102	BYA6D1	B-210	5HK-D1	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C39	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C40	10000		15-10317	BPD-01	DD-103	BYA10S1	B-110	5HK-S1	
C41	47		15-47011	NPO-DI 47	DD-470	L10Q47	CNO-447	5TCC-Q47	10%
C42	20000		15-20317	BPD-02	DD-203	BYB6S2	B-120	5HK-D2	
C43	2000		15-20211				JL-220		10%
C44	20000		15-20317	BPD-02	DD-203	BYB6S2	B-120	5HK-D2	
C45	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-D2	
C46	20000		15-20316	BPD-02	DD-203	BYB6S2	B-120	5HK-D2	
C47	.0033	1000	15-33268	P1088N-0033	D6-332	CUB16D33	GEM-16233	MB-D33	
C48	.0033	1000	15-33268	P1088N-0033	D6-332	CUB16D33	GEM-16233	MB-D33	
C49	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C50	.047	600	20-647-1	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	Note 1

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	A24-315-0	BT-7417	A47F3-1meg	Q18-137X	UT-440	Loudness, Tap @ 100K
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	2meg	½	A24-172-2	B-75	A47-2meg-Z	Q11-139	U56	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	A24-6-3	B-75	A47-2meg-Z	Q11-139	U56	Compensator
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R4	10Ω		60-10001	
R5	2.2meg		60-22502	
R6	10K		60-10301	
R7	68K		60-68301	
R8	68Ω		60-68001	
R9	10Ω		60-10001	
R10	2.2meg		60-22502	
R11	10K		60-10301	
R12	100K		60-10401	
R13	15Ω		60-15001	
R14	18K		60-18301	
R15	33K	1	60-33311	
R16	470Ω		60-47101	
R17	2.2meg		60-22502	
R18	4700Ω		60-47201	
R19	22K	1	60-22311	
R20	22K		60-22301	
R21	100K		60-10401	
R22	3900Ω		60-39201	
R23	82K	1	60-82311	
R24	68Ω		60-68001	
R25	100K		60-10401	
R26	390K		60-39401	
R27	2.2meg		60-22502	
R28	4700Ω		60-47201	
R29	56K	1	60-56311	
R30	68Ω		60-68001	

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R31	68Ω		60-68001	
R32	68K		60-68301	
R33	15K		60-15301	
R34	470K		60-47401	
R35	470K		60-47401	
R36	220K		60-22401	
R37	8200Ω		60-82201	
R38	1meg		60-10501	
R39	220K		60-22401	
R40	120K		60-12401	
R41	470Ω		60-47101	
R42	82K		60-82301	
R43	220K		60-22401	
R44	220K		60-22401	
R45	220K		60-22401	
R46	120K		60-12401	
R47	470Ω		60-47101	
R48	100Ω		60-10101	
R49	270Ω	2	60-27121	
R50	270Ω	2	60-27121	
R51	220K		60-22401	
R52	100Ω		60-10101	
R53	33K	2	60-33321	
R54	750Ω	10	61-128-0	
R55	900Ω	5	61-17-0	
R56	8000Ω	15	61-136-0	
R57	5.6Ω		60-56901	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	10-144-1					
L2	FM RF Coil	10-145-1					
L3	Cathode Choke	10-129-1					.55 Microhenry
L4	FM Osc. Coil	10-3-3					
L5	Loop Ant.	82-7-1					
L6	AM Osc. Coil	10-46-4		BC-393			
L7	RF Choke	19-129-1					.55 Microhenry
L8	1st FM IF	19-44-2	16-3487	FM-254	1463		
L9	1st AM IF	10-101-2	16-6758	BC-352	12-C1	RF-1	
L10	2nd FM IF	10-44-2	16-3487	FM-254	1463		
L11	2nd AM IF	10-45-2	16-6758	BC-353	12-C2	RF-2	
L12	Ratio Detector	10-15-0	17-3498	FM-255	1465		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .98A	600VCT @ .125A	5V @ 3A	80-23-0		P-2844				
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 4A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω CT	6-8Ω	80-65-1	Z1011	A-2904①	AU-609	A-3870	24S55	S-55X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	33-378-4	12A6AZ7.8	
SP2	4"	PM	3-4Ω	33-362-4	4A15TZ4.1	
SP3	4"	PM	3-4Ω	33-362-4	4A15TZ4.1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	33-235-0 ①	53-T	GD-J			① Includes needle

ASTITIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	83-1172	† S-66 or †♦ S-66SD or ♦ S-66D	† W-75TPS or †♦ W-75DS or ♦ W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Dial Lamp	89-7	#47
M4	Dial Lamp	89-7	#47
M5	Cabinet Lamp	89-16	#51
M6	Tuning Cap.	19-4-4	4 Gang (AM Sections: Ant. 5-420mmf, Osc. 9-135mmf)
M7	Switch	69-268-0	AM-FM-Phono, Rotary, Wafer Type
M8	Switch	69-269-0	Automatic-Manual, SPDT, Slide Type
M9	Switch	84-6552	Record Changer, On-Off
	Dial Pointer	52-60-1	
	Dial Scale	67-648-0	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-738-0	Tuning
Knob	52-1083-0	4 used
Knob	52-1122-0	On-Off-Reject
Knob	52-917-0	Speed Control
Cabinet	42-66-3	Model 9055
Cabinet	42-67-3	Model 9056
Leg	49-324	4 used, Model 9055
Leg	49-325	4 used, Model 9056

WIRING DATA

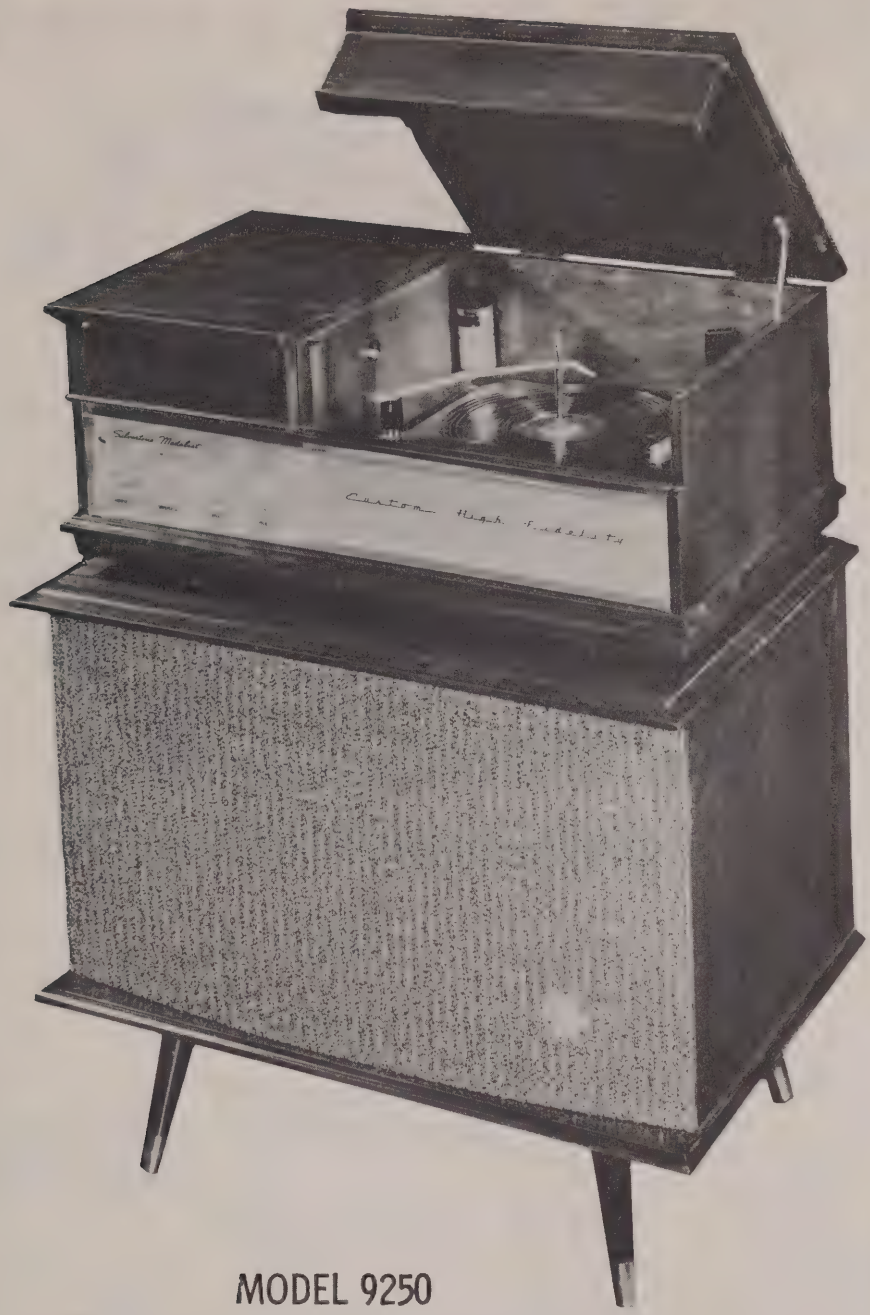
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 9250, 9250A, 9251, 9251A (Ch. 528.59180, 528.59181)

SILVERTONE MODELS 9250, 9250A, 9251, 9251A (Ch. 528.59180, 528.59181)



MODEL 9250

SILVERTONE MODELS 9250, 9250A, 9251, 9251A (Ch. 528.59180, 528.59181)

TRADE NAME	Silvertone Models 9250, 9251 (Ch. 528.59180); 9250A, 9251A (Ch. 528.59181)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES	Five
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 82 Watts, .81 Amp @ 117 Volts AC

RECORD CHANGER 528.56320 OR 528.56330 USED IN MODELS 9250, 9251
RECORD CHANGER 528.56380 OR 528.56390 USED IN MODELS 9250A, 9251A

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	AF Amplifier	12AX7
V2	AF Amp. -Phase Inv.	12AX7
V3	Output	6BQ5/ EL84
V4	Output	6BQ5/ EL84
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	450	①	AFH3-140-50	C1070	FP367.5	TMT-133	T-680	TVL-3754.5
B	▙30	450							
C	▲20	25							
C2A	▲20	350	18-32-3	AFH2-37	B0500	FP434	TMD-61	T-140	TVL-2935
B	▲20	350							

① C1A may be 30mfd in some versions (C1 Part #18-33-3).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

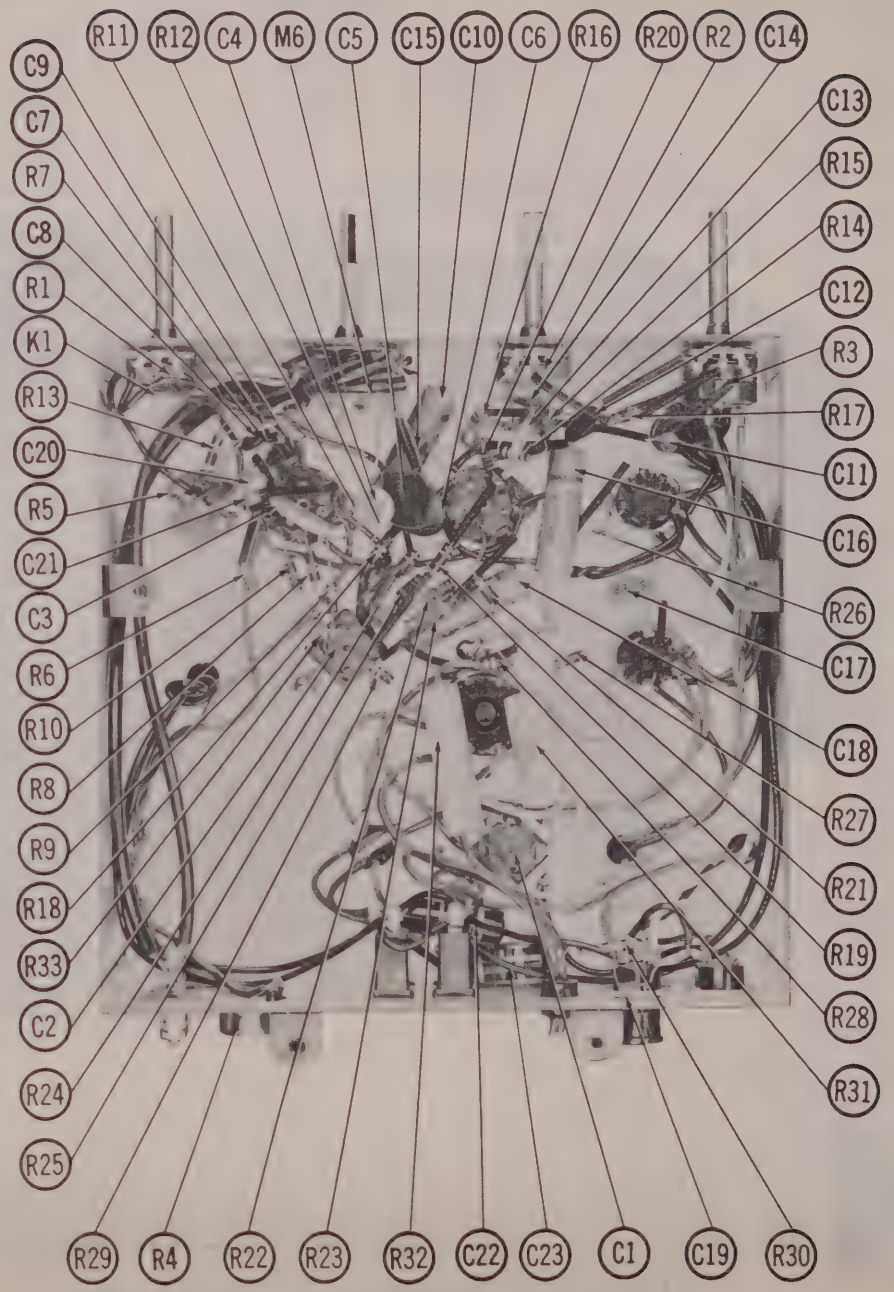
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	20000		15-20316	BPD-02	DD-203	BYB6S2		5HK-S2	
C4	2000		15-20211	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C5	5000		15-50211	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C6	3000		15-30211	BPD-003	DD-302	BYA10D3	UC-523	5GA-D3	
C7	750		15-75111	DI-00075	DD-751	L10T75	UC-5375	5GA-T75	
C8	330		15-33111	BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C9	1500		15-15211	BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C10	.047	400	16-47343	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C11	220		15-22111	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C12	2000		15-20211	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C13	2000		15-20211	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C14	20000		15-20316	BPD-02	DD-203	BYB6S2		5HK-S2	
C15	220		15-22111	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C16	.047	400	16-47343	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C17	1000	2000	15-10236	HVD-30-1000	DD30-102	HVB20D1	DC3021	20GA-D1	
C18	.047	400	16-47343	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C19	680		15-68111	BPD-00068	DD-681	L10T68	UC-5368	5GA-T68	
C20	.68				TCZ-R68				①
C21	.68				TCZ-R68				①
C22	.047	400	16-47348			PJ4S47		4TM-S47	
C23	.047	400	16-47348			PJ4S47		4TM-S47	

① Some versions use 10mmf in this application (Part #15-10011).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	24-309-0	BT-167				Loudness, Tap@150K & 300K
B	Shaft			Not Req.				
R2A	1meg	½	24-170-2	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	24-169-2	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R4	200Ω	1(WW)	24-1-3					Hum Adjust

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R5	1meg		60-10501	Note 1
R6	220K		60-22401	
R7	2200Ω		60-22201	
R8	220K		60-22401	
R9	220K		60-22401	
R10	2200Ω		60-22201	
R11	560K		60-56401	
R12	1.5meg		60-15501	
R13	100K		60-10401	
R14	47K		60-47301	
R15	150K		60-15401	
R16	10K		60-10301	
R17	100K		60-10401	
R18	100K		60-10401	
R19	120K		60-12401	
R20	470Ω		60-47101	
R21	220K		60-22401	
R22	6800Ω		60-68201	
R23	100K		60-10401	
R24	120K		60-12401	
R25	470Ω		60-47101	
R26	100Ω		60-10101	
R27	100Ω		60-10101	
R28	220K		60-22401	
R29	27K		60-27301	
R30	10K		60-10301	
R31	180Ω	4	61-10-1	
R32	500Ω	10	61-108	
R33	27K		60-27301	

Note 1. Chassis 528.59181 uses 220K in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .81A	740VCT @ .100A	5V @ 1.8A	80-4-0		P-2952 ①		PC8409	24R04U	R-11A
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.6A									

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	33-282-4	12A6PA	① Models 9250 & 9251 use Part #33-204-4
SP2	5"	PM	3-4Ω	33-304-4 ①	5A1	
SP3	5"	PM	3-4Ω	33-304-4 ①	5A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1	33-286-1					Models 9250, 9251
	33-299-0					Models 9250A, 9251A

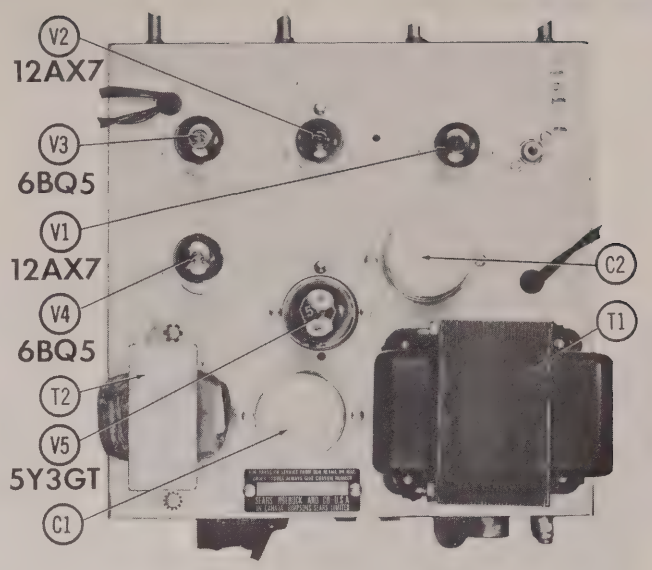
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	88-1178	† S-61 or †♦ S-61SD or ♦ S-61D	† W-77TPS or †♦ W-77DS or ♦ W-77TPD	Models 9250, 9251
	83-1251 (LP)			Models 9250A, 9251A
	83-1250 (78)			

† Jewel ♦ Diamond

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Lamp	89-7	#47
M4	Lamp	89-15	120V, 7W
M5	Lamp	89-15	120V, 7W
M6	Switch	69-266-0	Compensator, Rotary, Wafer Type

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Tone Compensation Circuit	27mmf, 18mmf, 3300mmf, 4700mmf, 68K, 330K, 47K	13-19-3	Sprague TCS-17

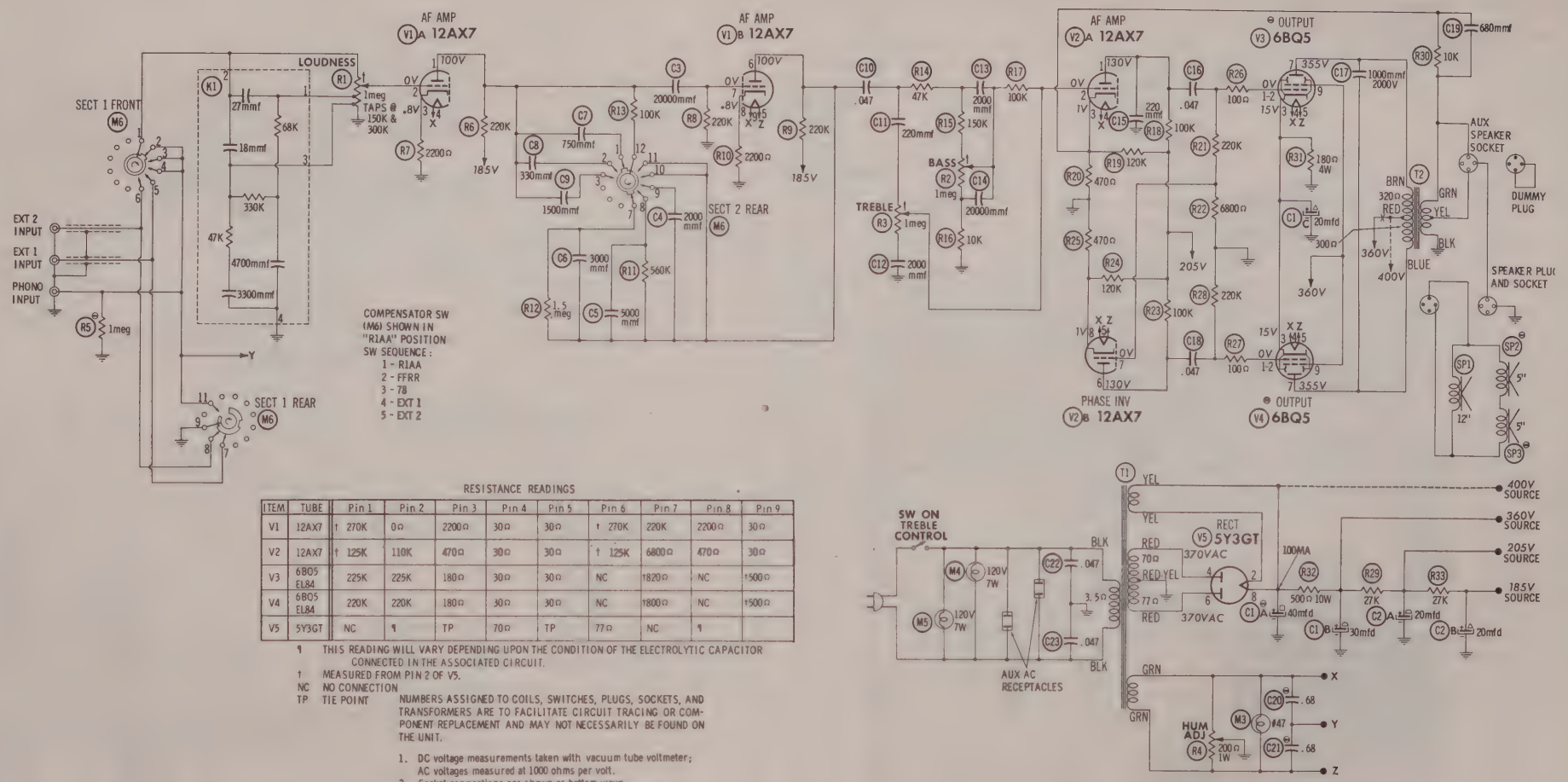
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1063-0	4 Used
Knob	52-1062-0	Indicator, 4 Used
Knob	52-1122-0	Off-On-Reject
Knob	52-917-0	Speed Control

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 270K	0Ω	2200Ω	30Ω	30Ω	† 270K	220K	2200Ω	30Ω
V2	12AX7	† 125K	110K	470Ω	30Ω	30Ω	† 125K	6800Ω	470Ω	30Ω
V3	6BQ5 EL84	225K	225K	180Ω	30Ω	30Ω	NC	†820Ω	NC	†500Ω
V4	6BQ5 EL84	220K	220K	180Ω	30Ω	30Ω	NC	†800Ω	NC	†500Ω
V5	5Y3GT	NC	¶	TP	70Ω	TP	77Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

† MEASURED FROM PIN 2 OF V5.

NC NO CONNECTION

TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODELS 9250, 9250A, 9251, 9251A (Ch. 528.59180, 528.59181)

PHOTOFACT* Folder

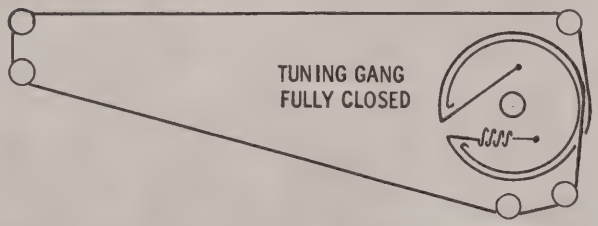
SYLVANIA MODEL 4701 (Ch. 1-625-1)

SYLVANIA MODEL
4701 (Ch. 1-625-1)

SYLVANIA MODEL
4701 (Ch. 1-625-1)

TRADE NAME	Sylvania Model 4701 (Ch. 1-625-1)	
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products, Inc., 700 Ellicott St., Batavia, N.Y.	
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer	
TUBES (Nine)	Types 6CB6 FM-AM RF Amplifier, 6U8 FM-AM Mixer - FM AM Osc., 6BA6 1st. FM-AM IF Amplifier, 6BA6 2nd. FM IF Amp.-AM Det.-AVC, 6AL5 Ratio Detector, 6AU6 AF Amplifier, (2) 6V6GT Output, 5Y3GT Rectifier	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .75 Amp. @ 117 Volts AC (76 Watts) Less Phono
TUNING RANGE-BROADCAST	535-1620KC	FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER 1-318-2 — SEE PHOTOFACT SET 401 FOLDER 13.



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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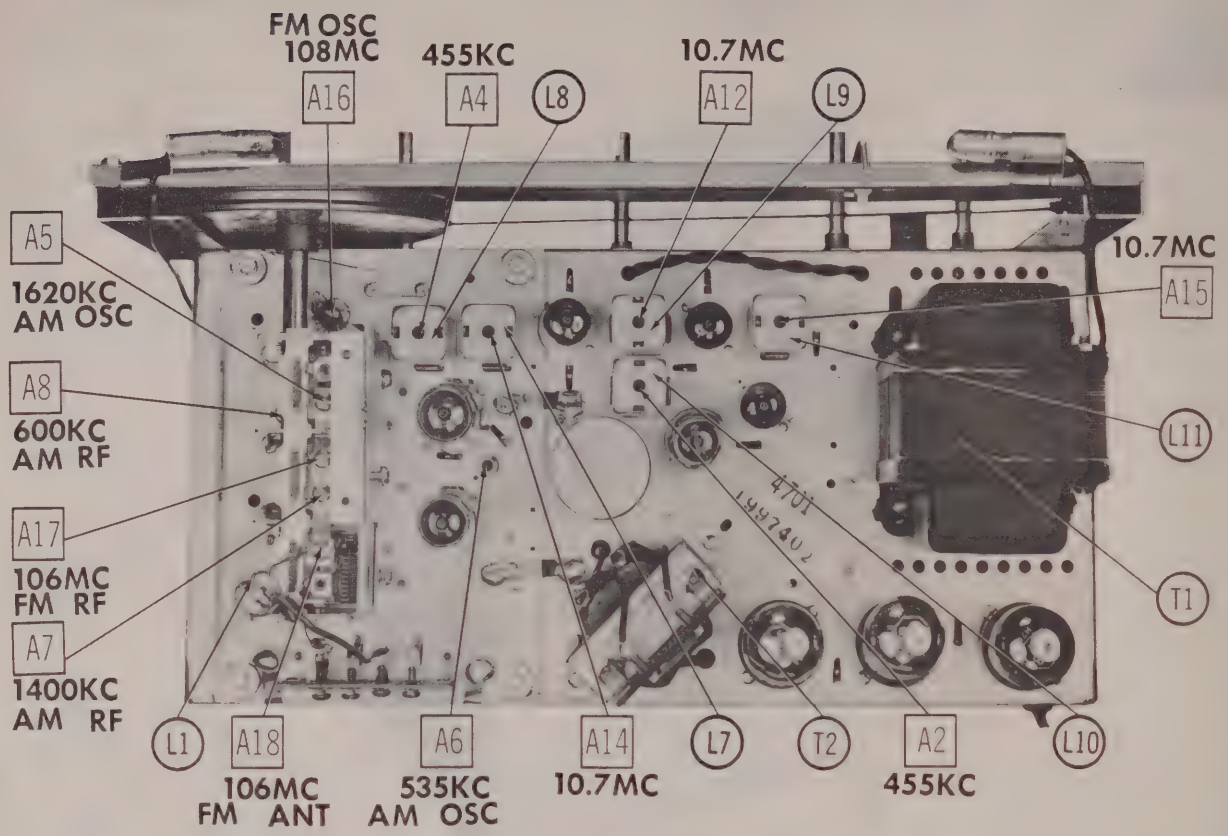
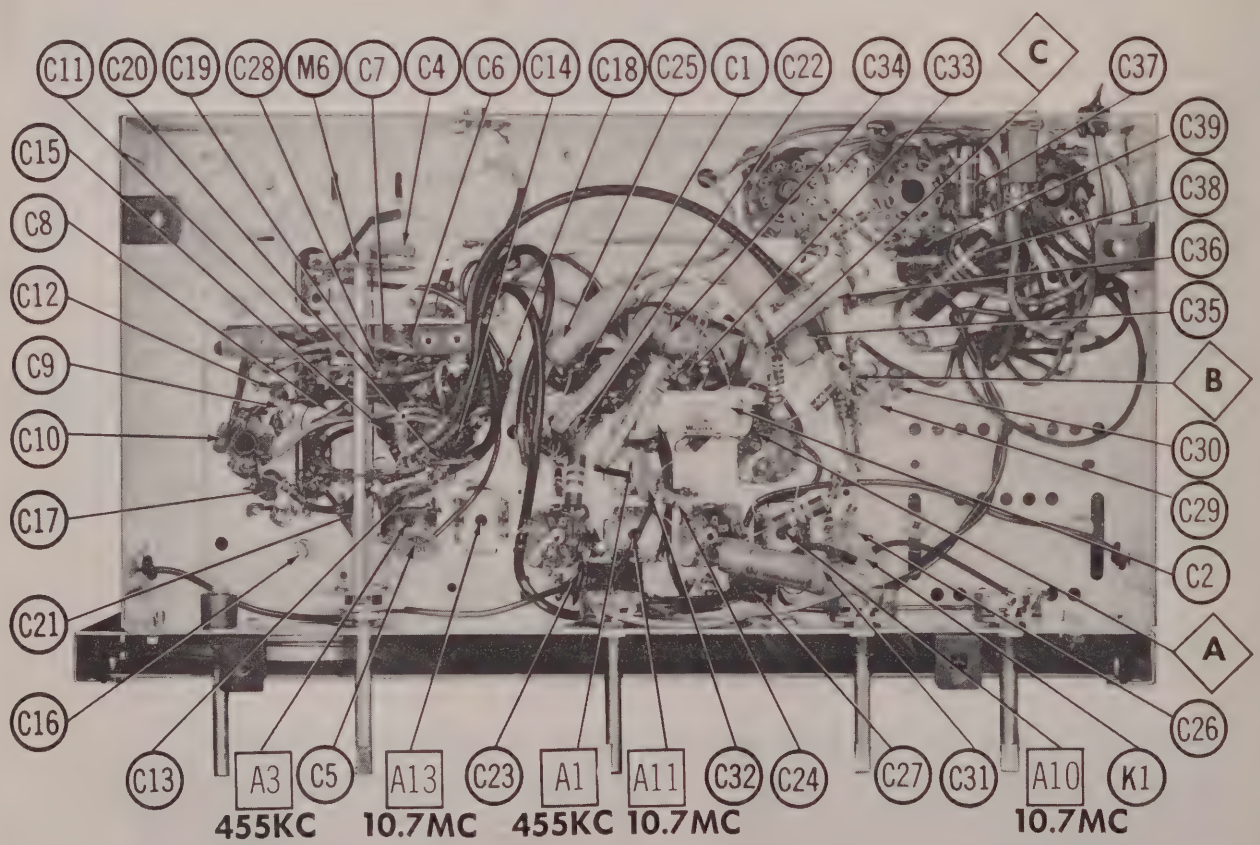


TUNER CHASSIS - TOP VIEW



TUNER CHASSIS BOTTOM VIEW - ALIGN, CAPACITOR, & MISC IDENT

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Tone control set at mid-position.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to AM RF stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	1620KC	"	A5	"
3.	"	"	535KC	"	535KC	"	A6	"
4.	"	High side to AM Ant. stator lug of tuning gang. Low side to chassis.	1400KC	"	1400KC	"	A7	"
5.	"	"	600KC	"	600KC	"	A8	"
6.		Loop	1400KC	"	1400KC	"	A9	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 thru 6.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.005mfd	High side to FM RF stator lug of tuning gang. Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.								
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.05mfd	High side to FM RF stator lug of tuning gang. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
8.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A15	Reconnect stabilizing capacitor C2. Adjust A15 so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	.005mfd	High side to FM RF stator lug of tuning gang. Low side to chassis.	108.5MC (Unmod)	FM	108.5MC	DC probe to point (A). Common to chassis.	A16	Adjust for maximum deflection.
10.	270Ω Carbon Resistor	High side thru 270Ω to FM Ant. terminal. Low side to chassis.	106MC	"	106MC	"	A17, A18	"
	Steps 11, 12, 13 are not necessary unless receiver fails to track properly.							
11.	270Ω Carbon Resistor	High side thru 270Ω to FM Ant. terminal. Low side to chassis.	88MC	FM	88MC	DC probe to point (A). Common to chassis.	L3	Adjust for maximum by compressing or expanding coil turns.
12.	"	"	108MC	"	108MC	"	A16	Adjust for maximum deflection.
13.	"	"	106MC	"	106MC	"	A17, A18	Adjust for maximum deflection. Repeat steps 11, 12 and 13.

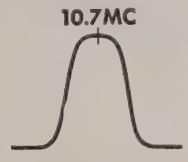


FIG. 1

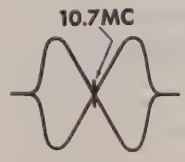
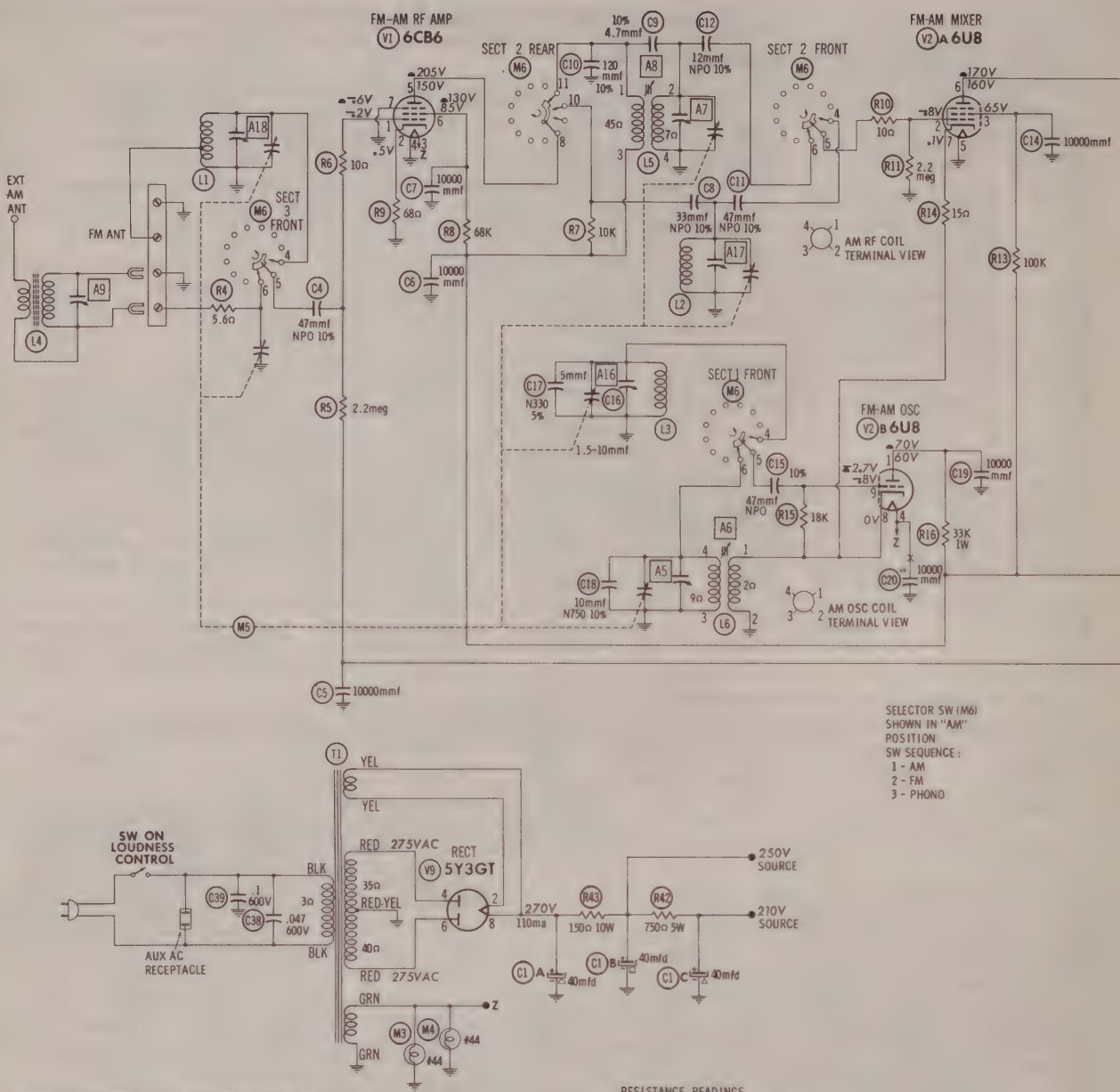


FIG. 2



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	2.4meg ◓4.8meg	68Ω	0Ω	.1Ω	†11K †◓1400Ω	†69K	0Ω		
V2	6[illegible]	†34K	2.2meg	†100K	.1Ω	0Ω	†11K	17Ω	2Ω	18K
V3	[illegible]A6	340K ◓2.5meg	0Ω	0Ω	.1Ω	†1900Ω	†28K	68Ω		
V4	6BA6	490K	0Ω	0Ω	.1Ω	† 3200Ω	† 28K	68Ω		
V5	6AL5	0Ω	15K	2.6Ω	.1Ω	INF	0Ω	INF		
V6	6AU6	10meg	0Ω	0Ω	.1Ω	†320K	†1.2meg	0Ω		
V7	6V6GT	0Ω	.1Ω	†260Ω	†900Ω	470K	NC	0Ω	150Ω	
V8	6V6GT	0Ω	.1Ω	†260Ω	†900Ω	470K	NC	0Ω	150Ω	
V9	5Y3GT	NC	¶	NC	35Ω	NC	40Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V9
◓ MEASURED IN "AM" POSITION
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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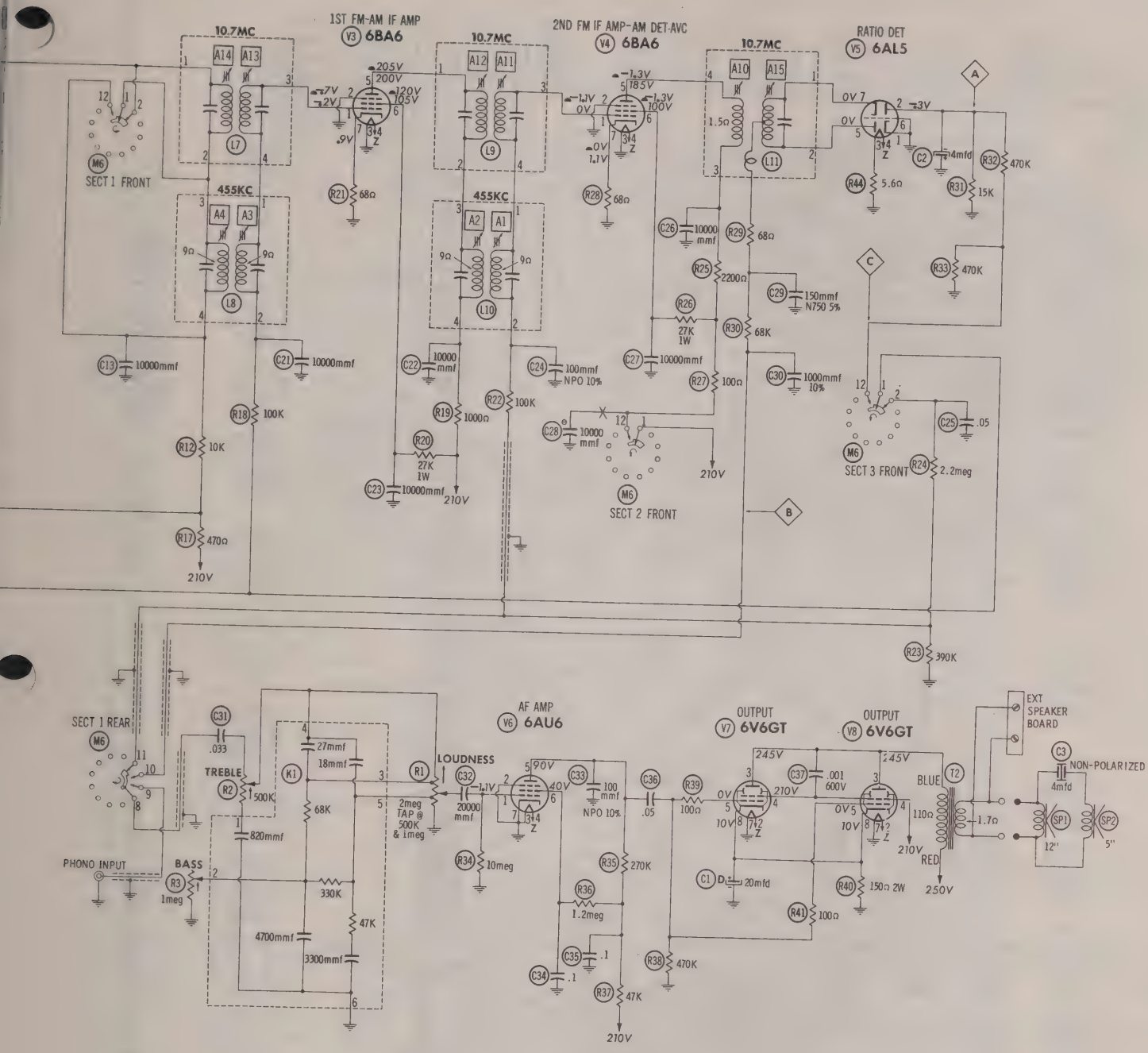
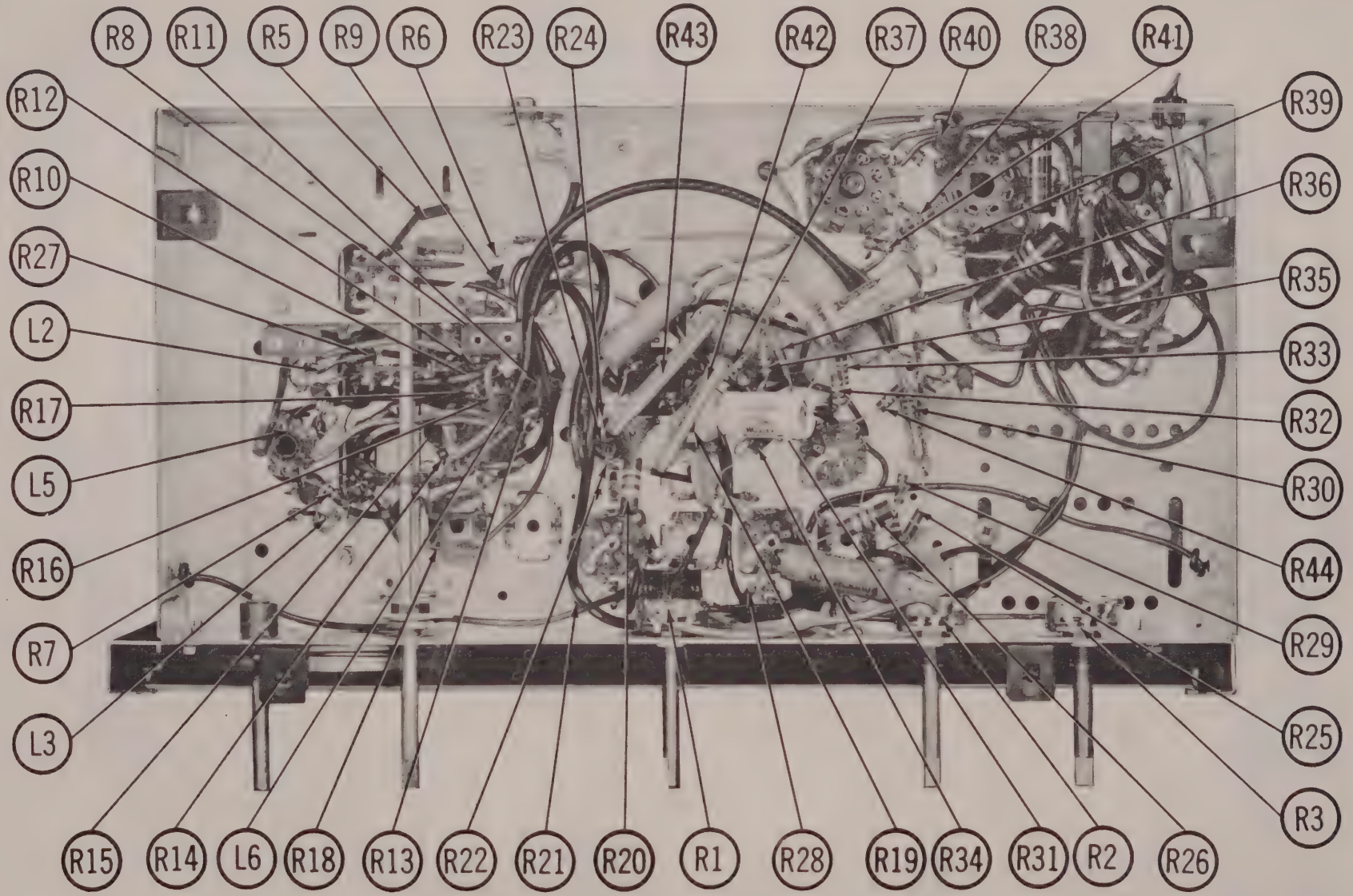


SYLVANIA MODEL 4701



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amp.	6CB6	
V2	FM-AM Mixer - FM-AM Osc.	6U8	
V3	FM-AM IF Amp.	6BA6	
V4	2nd. FM IF Amp. - AM Det. - AVC	6BA6	
V5	Ratio Detector	6AL5	
V6	AF Amp.	6AU6	
V7	Output	6V6GT	
V8	Output	6V6GT	
V9	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	161-4026	AFH4-53	D0460	FP430.6	TMQ-58	Q-215	TVL-4622.3
B	■40	350							
C	▲40	350							
D	20	25							
C2	4	50	161-1008	PRS150V4	BBR4-50	TC30	TD-4-50	MT-0504	TVA-1402
C3	4	150NP	161-1044	NP-PRS450V4	BBR8-150 † BBR8-150	TC41 † TC41	TD-8-150 † TD-8-150	MT-1508 † MT-1508	R1251 *

† Connect negative leads together.

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

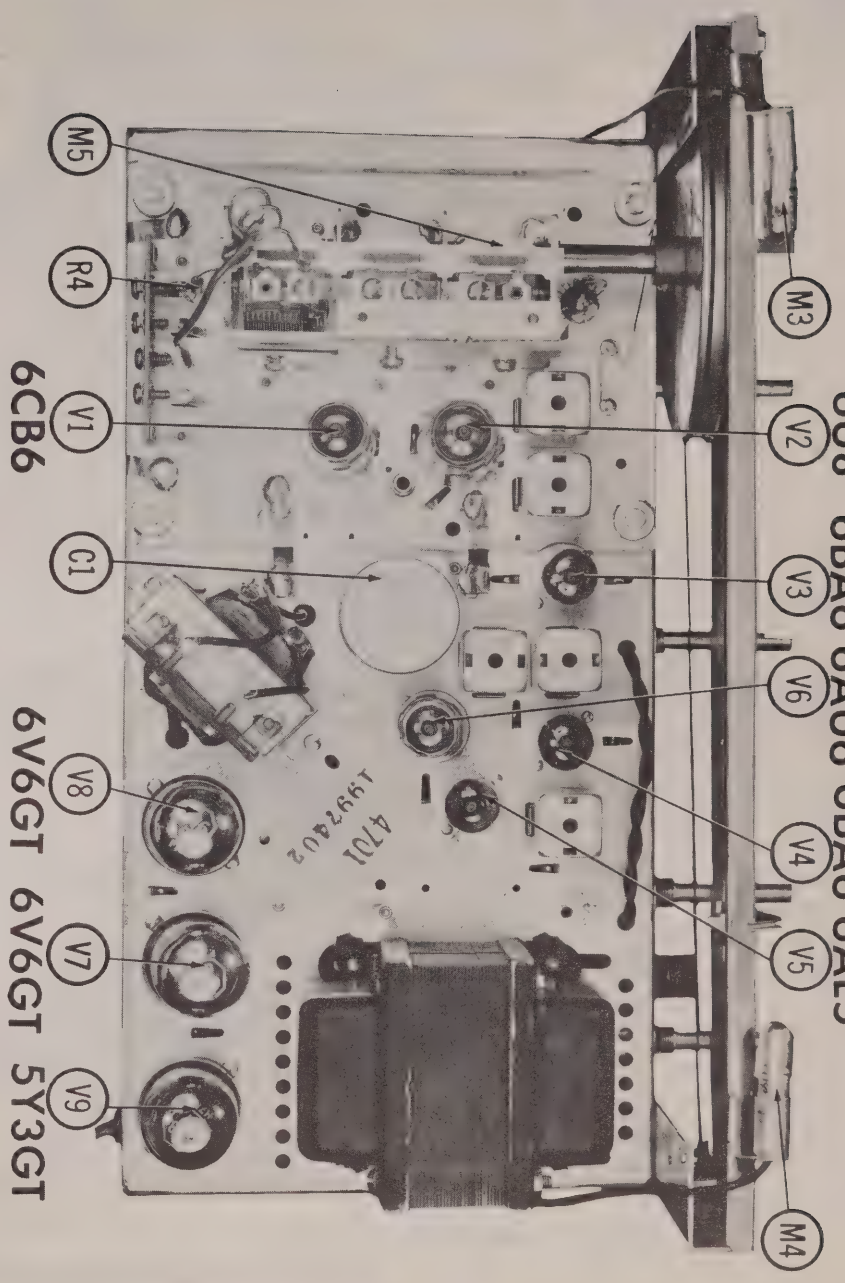
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	47			NPO-SI 47	TCZ-47	CTA6Q47C		5TCC-Q47	NPO 10%
C5	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C7	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C8	33			NPO-SI 33	TCZ-33	CTA6Q33C	ZT-5433	5TCC-Q33	NPO 10%
C9	4.7			NPO-SI 4.7	TCZ-4R7	CTA6V47C	ZT-5547	5TCCB-V47	10%
C10	120			NPO-SI 120	D6-121	CTA6T12C		5TCC-T12	10%
C11	47			NPO-SI 47	TCZ-47	CTA6Q47C		5TCC-Q47	NPO 10%
C12	12			NPO-SI 12	TCZ-12	CTA6Q12C			NPO 10%
C13	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C14	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C15	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C16	1.5-1.0		172-0040		829-10				N330 5%
C17	5			N750-SI 10	TCN-10	CTA6Q1U	NT-541	5TCU-Q1	N750 10%
C18	10			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C19	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	①
C20	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C21	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C22	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C23	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C24	100			NPO-SI 100	TCZ-100	CTA6T1C	ZT-531	5TCC-T1	NPO 10%
C25	.05	200		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C26	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C27	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C28	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	①
C29	150				DTN-150				N750 5%
C30	1000								10%
C31	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C32	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C33	100			NPO-SI 100	TCZ-100	CTA6T1C	ZT-531	5TCC-T1	NPO 10%
C34	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C35	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C36	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C37	.001	600		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C38	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C39	.1	600		P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	

① Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	152-0045				PP-26DT16	Loudness, Tap @ 500K
B	Switch						Not	Pull Type & 1meg
R2A	500K	½	153-0147	B-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	153-0148	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R4	5.6Ω		189-0059	
R5	2.2meg			
R6	10Ω			
R7	10K			
R8	68K			
R9	68Ω			
R10	10Ω			
R11	2.2meg			
R12	10K			
R13	100K			
R14	15Ω			
R15	18K			
R16	33K	1		
R17	470Ω			
R18	100K			
R19	1000Ω			
R20	27K	1		
R21	68Ω			
R22	100K			
R23	390K			
R24	2.2meg			

ITEM No.	RATING		SYLVANIA PART No.	NOTES
	OHMS	WATT		
R25	2200Ω			
R26	27K	1		
R27	100Ω			
R28	68Ω			
R29	68Ω			
R30	68K			
R31	15K			
R32	470K			
R33	470K			
R34	10meg			
R35	270K			
R36	1.2meg			
R37	47K			
R38	470K			
R39	100Ω			
R40	150Ω	2		
R41	100Ω			
R42	750Ω	5(WW)	197-0056	
R43	150Ω	10(WW)	187-0059	
R44	5.6Ω		189-0059	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		SYLVANIA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	111-0024					
L2	FM RF Coil	112-0016					
L3	FM Osc. Coil	113-0042					
L4	Loop Stick	581-0014					
L5	AM RF Trans.	112-0015					
L6	AM Osc. Coil	113-0041	14-1073 *	BC-393 *	69-OSC *		* Disregard capacity wind
L7	1st. FM IF	121-0106	16-3487	FM-254	1463		
L8	1st. AM IF	121-0105	16-6758	BC-352	12-C1	RF-1	
L9	2nd. FM IF	121-0106	16-3487	FM-254	1463		
L10	2nd. AM IF	121-0105	16-6758	BC-353	12-C2	RF-2	
L11	Ratio Det.	127-0001	17-3498	FM-255	1465		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @.75A	520VCT @.110A	5V @1.8A	141-0075	P9208	P-2882		PC8405		R-12A
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @3A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2400Ω	6-8Ω	143-0066	Z1104	A-2905	AU-607		24863		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	539-1209	12A31Z8	
SP2	5"	PM	3-4Ω	539-0507	5AIR	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
C1	Tone Compensation	18mmf, 27mmf, 820mmf, 4700mmf, 3300mmf, 47K, 68K, 330K	190-0038	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SYLVANIA PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	916-0007	53-T	GD-J			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SYLVANIA PART No.	JENSEN PART No.	WALCO PART No.	
M2	902-0008	†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Lamp		#47
M4	Lamp		#47
M5	Tuning Cap.	170-0028	6 Gang (AM Sections: Ant. 16-481mmf, RF 29-405mmf, Osc. 18-165mmf)
M6	Switch		Function, Rotary wafer type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	740-0187	Tuning
Knob	740-0186	Function, Bass, Treble, Loudness
Pointer	792-0021	
Glass	721-0017	Dial Scale
Plate	727-0007	Dial Background
Adapter	922-0012	45RPM

WIRING DATA

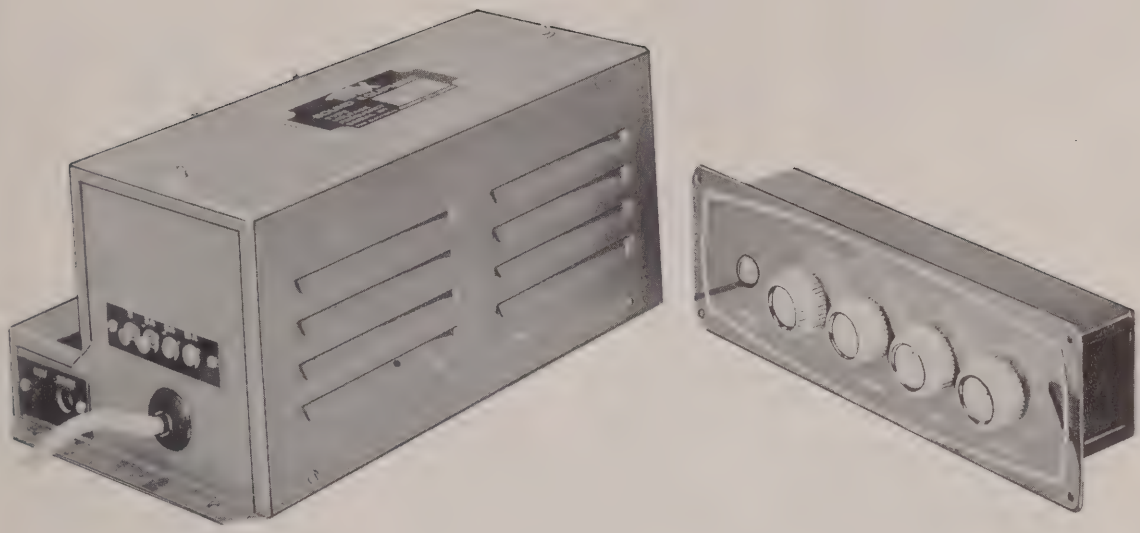
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRIX
MODEL T43

TRIX
MODEL T43



TRIX
MODEL T43

TRADE NAME	Trix Model T43
SUPPLIER	Electronics Div., Ercona Corp., 16 W. 46th St., New York 36, N. Y.
TYPE SET	AC Operated 4 Tube Audio Amplifier And Control Box
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 52 Watts, .45 Amp. @117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1959 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H966

SET 440 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp.	ECC83/ 12AX7	①
V2	AF Amp. -Output	ECL82/ 6BM8	①
V3	Phase Inv. -Output	ECL82/ 6BM8	①
V4	Rectifier	EZ80/ 6V4	①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	32	350		AFH3-41	D0120	FP376.6	TMT-36	TVLS-3639.13*	
B	8	350							
C	8	350							
C2A	8	450			D0080	WP433.6	TMQ-9	TVLS-2749*	
B	8	450							
C3	25	12		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	
C4	25	12		PRS25V25	BBR25-25	TC26	TD-25-25	TVA-1205	
C5	25	25		PRS25V25	BBR25-25	TT25X25	TD-25-25	TVA-1205	

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RATING TOL	REPLACEMENT DATA TRIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	20000				SI 20000	DD-203	LT6S2	B-120	5GA-S2	
C7	100				SI 100	D6-101	LT6T1	CNO-310	5GA-T1	
C8	.05	350			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C9	500				SI 500	D6-501	LT6T5	B-350	5GA-T5	
C10	10000				SI 10000	D6-103	LT6S1	B-110	5GA-S1	
C11	2000				SI 2000	D6-202	LT6D2	B-220	5GA-D2	
C12	.1	350			P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C13	2000				SI 2000	D6-202	LT6D2	B-220	5GA-D2	
C14	.05	350			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C15	2000				SI 2000	D6-202	LT6D2	B-220	5GA-D2	
C16	.05	350			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C17	.05	350			P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C18	.005	750			P1088N-005	DD-502	CUD10D5	GEN-1025	10TM-D5	
C19	.005	750			P1088N-005	DD-502	CUD10D5	GEN-1025	10TM-D5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½		B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½		B-77		Q17-139		Treble
B	Switch			KR-2		76-2		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	TRIX PART No.	NOTES
R4	47K			
R5	47K			
R6	10K			
R7	1meg			
R8	10K			
R9	47K			
R10	47K			
R11	47K	1		
R12	47K	1		
R13	2200Ω			
R14	100K			
R15	47K	1		
R16	4700Ω			
R17	100K			
R18	470K			
R19	470K			
R20	100K			
R21	2200Ω			
R22	270K			
R23	270K			
R24	100K			
R25	27K			
R26	100K			
R27	47K	1		
R28	2200Ω			
R29	47K			
R30	470K			
R31	47K	5%		
R32	47K	1		
R33	2200Ω			
R34	47K	5%		
R35	220K			
R36	10K			Note 1
R37	10K			Note 2
R38	330Ω	2		
R39	220K			
R40	47Ω	1		
R41	47Ω	1		

Note 1. 4700Ω 1W may be used in some versions.
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TRIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	230V Tap @ 117V @ .45A	525 VCT @ .070A	6.3V @ 2.5A	E-853						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRIX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5400Ω CT	15Ω Tap @ 8Ω, 3Ω	E-839	Z1011	A-2901①	AU-609	A-3870	24S55	S-55X	① Drill new Mounting hole

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA TRIX PART No. FUSE	TRIX PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 250V	①		312003. (3A 250V)	357001	AGC3	4406

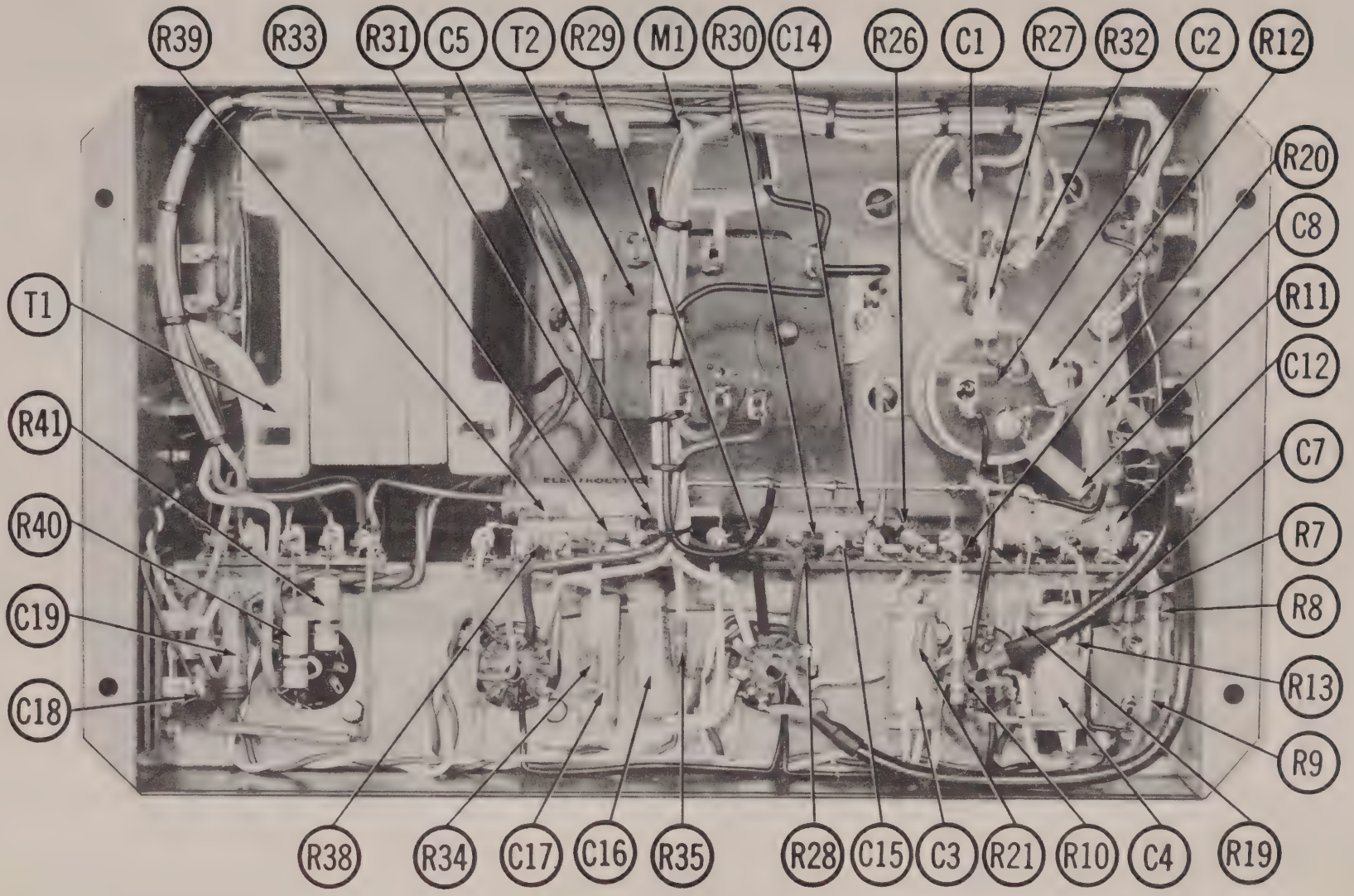
① Not used in some versions.

MISCELLANEOUS

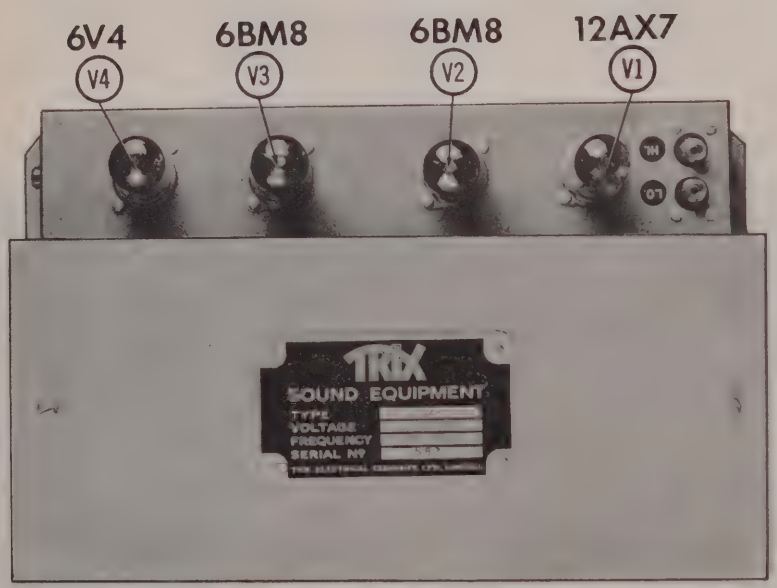
ITEM No.	PART NAME	TRIX PART No.	NOTES
M2	Lamp		6.5V, 0.3A (OSRAM)
M3	Switch		Selector (5 Position, Rotary Wafer Type)

WIRING DATA

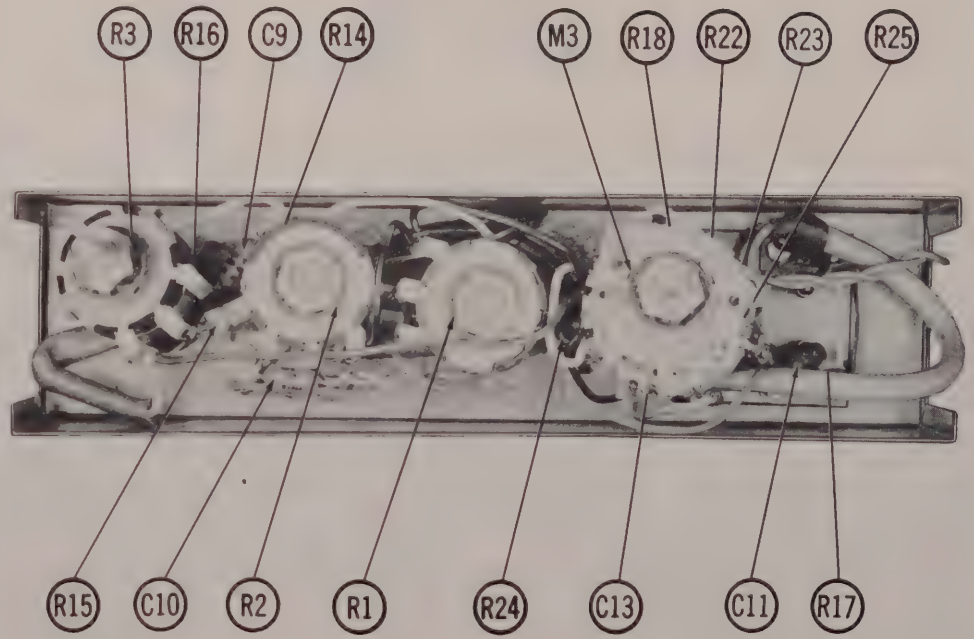
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



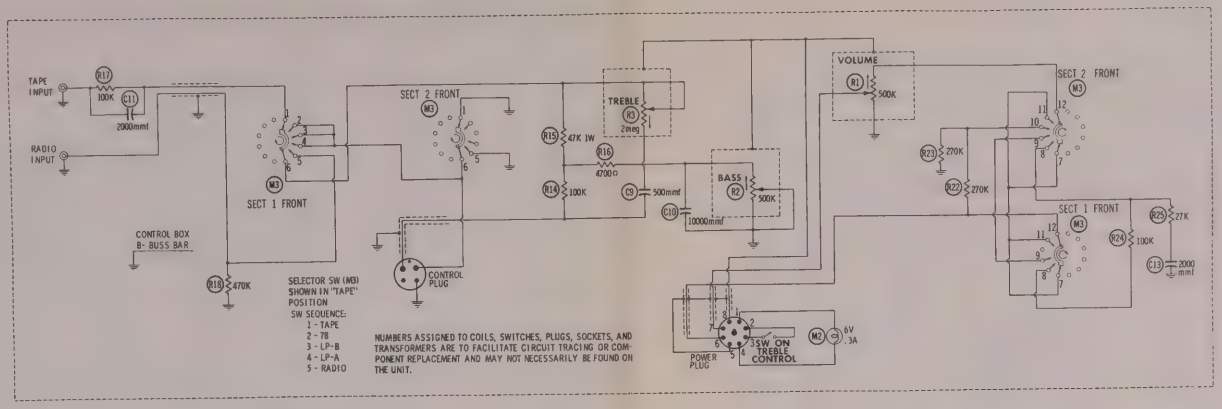
CHASSIS - BOTTOM VIEW

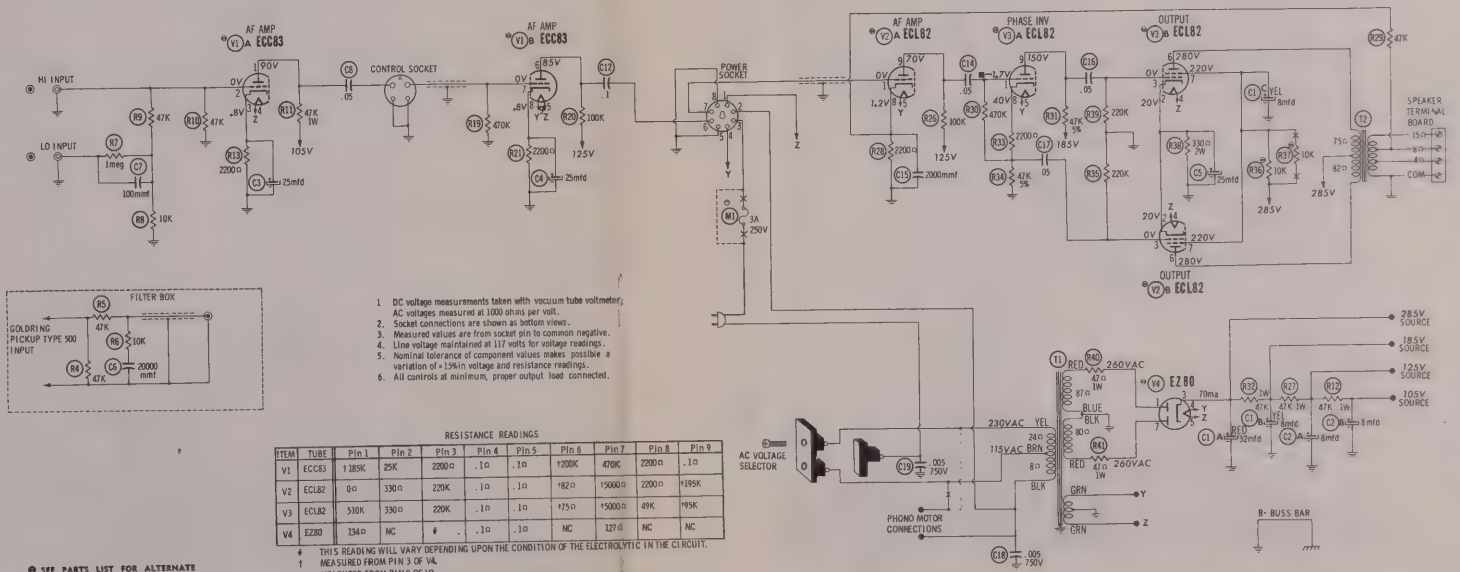


CHASSIS - TOP VIEW



CONTROL UNIT





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±5%in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	†185K	25K	2200Ω	.1Ω	.1Ω	†200K	470K	2200Ω	.1Ω
V2	ECL82	0Ω	330Ω	220K	.1Ω	.1Ω	†82Ω	†5000Ω	2200Ω	†195K
V3	ECL82	510K	330Ω	220K	.1Ω	.1Ω	†75Ω	†5000Ω	49K	†95K
V4	EZ80	134Ω	NC	#	.1Ω	.1Ω	NC	127Ω	NC	NC

\# THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4.
■ MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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TRIX
MODEL T43

PHOTOFACT* Folder with CIRCUITRACE*

WESTINGHOUSE MODELS H-659P4, H-660P4, H-662P4, H-663P4, H-664P4 (Ch. V-2394-1, -2)

WESTINGHOUSE MODELS H-659P4, H-660P4, H-662P4, H-663P4, H-664P4 (Ch. V-2394-1, -2)

MODEL H-659P4

TRADE NAME	Westinghouse Models H-659P4, H-660P4 (Ch. V-2394-1); H-662P4, H-663P4, H-664P4 (Ch. V-2394-2)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	Three Power Portable AM Receiver
TUBES	Four
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 9 Volts DC "A" Supply & 90 Volts DC "B" Supply 8 Watts, .13 Amp. @ 117 Volts AC (or) 53MA @ 9 Volts DC & 12MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540 - 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1mfd capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1, A2, A3, A4.....GENERAL CEMENT #8195, 8987, 8989, 8988, 8729, 8728, 5008, 8275
WALSCO #2531, 2532
A5, A6.....GENERAL CEMENT #5004, 5008
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to antenna stator lug of tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200mmf to reduce hum modulation.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 and 3.

DISASSEMBLY

Models H-659P4, H-660P4

1. Press the two buttons on the sides of the cabinet and open the case.
2. Disconnect the batteries and free the leads.
3. Remove two screws holding the AC receptacle.
4. Remove two screws holding the chassis bracket to the case top.
5. Disengage volume control knob. (Knob is captive and remains with case).
6. Slide chassis from case.

Models H-662P4, H-663P4, H-664P4

1. Perform steps 1, 2 and 3 above.
2. Unsolder the telescoping and loop antenna leads.
3. Disengage volume control knob. (Knob is captive and remains with case).
4. Remove two screws holding chassis bracket to case top.
5. Slide chassis from case.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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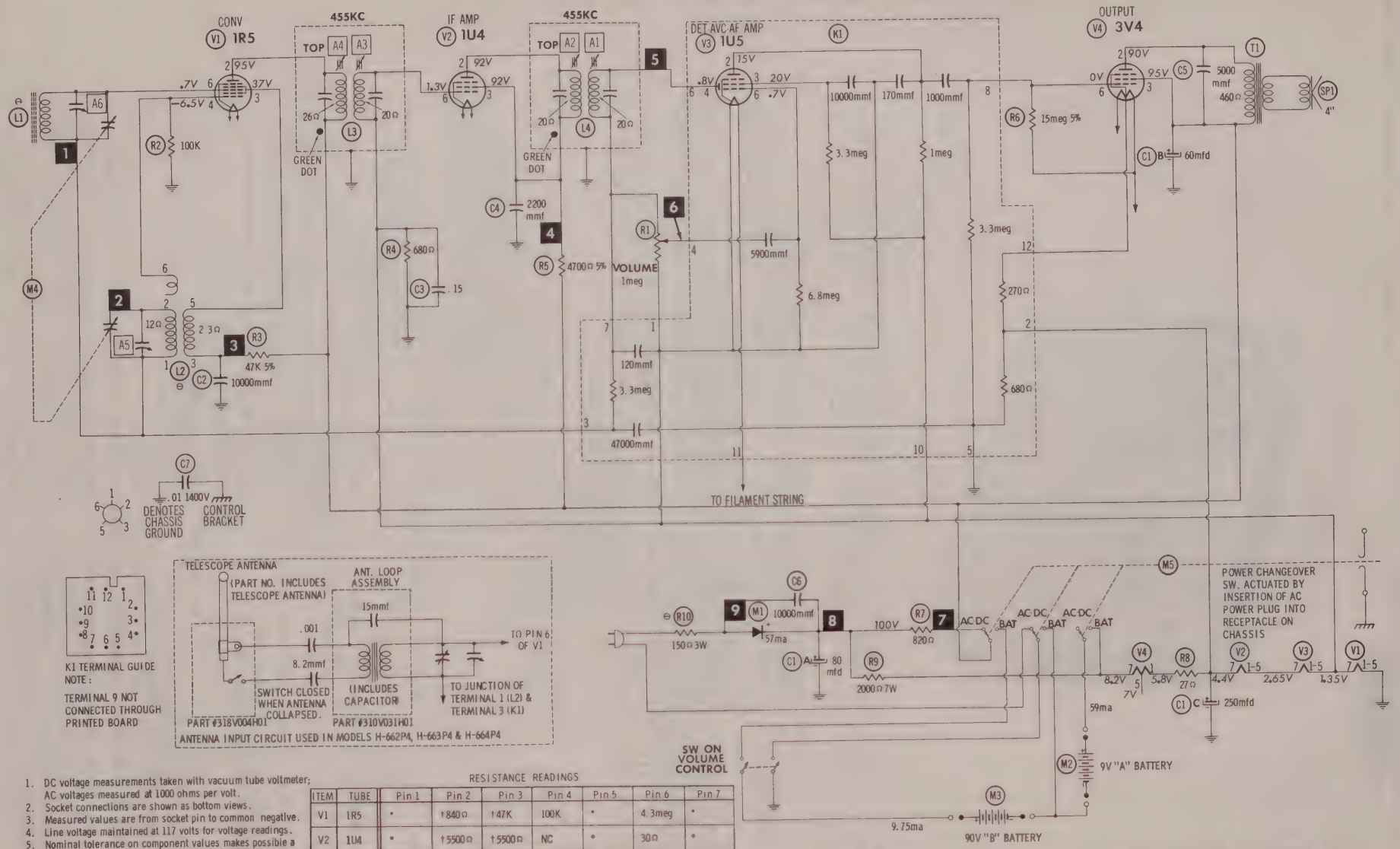
H869

SET 440 FOLDER 16



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†840Ω	†47K	100K	•	4.3meg	•
V2	1U4	•	†5500Ω	†5500Ω	NC	•	30Ω	•
V3	1U5	•	†1meg	†3.3meg	1meg	NC	6.8meg	•
V4	3V4	•	†1200Ω	†820Ω	NC	•	2.3meg	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

WESTINGHOUSE MODELS H-659P4, H-660P4, H-662P4, H-663P4, H-664P4 (Ch. V-2394-1, -2)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det. - AVC - AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	218V025H18						R2744 *
B	60	150							
C	250	15							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000		215V111A03	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C3	.15	200	210V111H08	P288N-15		CUB2P15	GEM-2015	2TM-P15	
C4	2200		215V112A22	BPD-0022	DD-222	BYA10D22	UC-5222	5HK-D22	
C5	5000		215V308H04	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C6	10000		215V111A03	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C7	.01	1400	215V306H03	DAC-27	DD16-103	HVE16S1		BL-S10	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	½	270V027H06					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R2	100K		250V231A04	
R3	47K 5%		250V234A73	
R4	680Ω		250V226A81	
R5	4700Ω 5%		250V234A72	
R6	15meg 5%		250V211A56	
R7	820Ω		250V228A21	
R8	27Ω		250V222A70	
R9	2000Ω	7	251V026H01	
R10	150Ω	3	251V025H02	Note 1

Note 1. Chassis V-2394-2 uses 5W (Part #251V020H55).

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	310V041H01					Note 1
L2	Osc. Coil	230V063H01					Note 2
L3	Input IF	235V043H01	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	235V043H02	16-6780	BC-357	13-PC2	RF-4	

Note 1. Part #310V031H01 (includes 15mmf Cap.) used in Chassis V-2394-2.
Note 2. Part #230V067H01 used in Chassis V-2394-2.

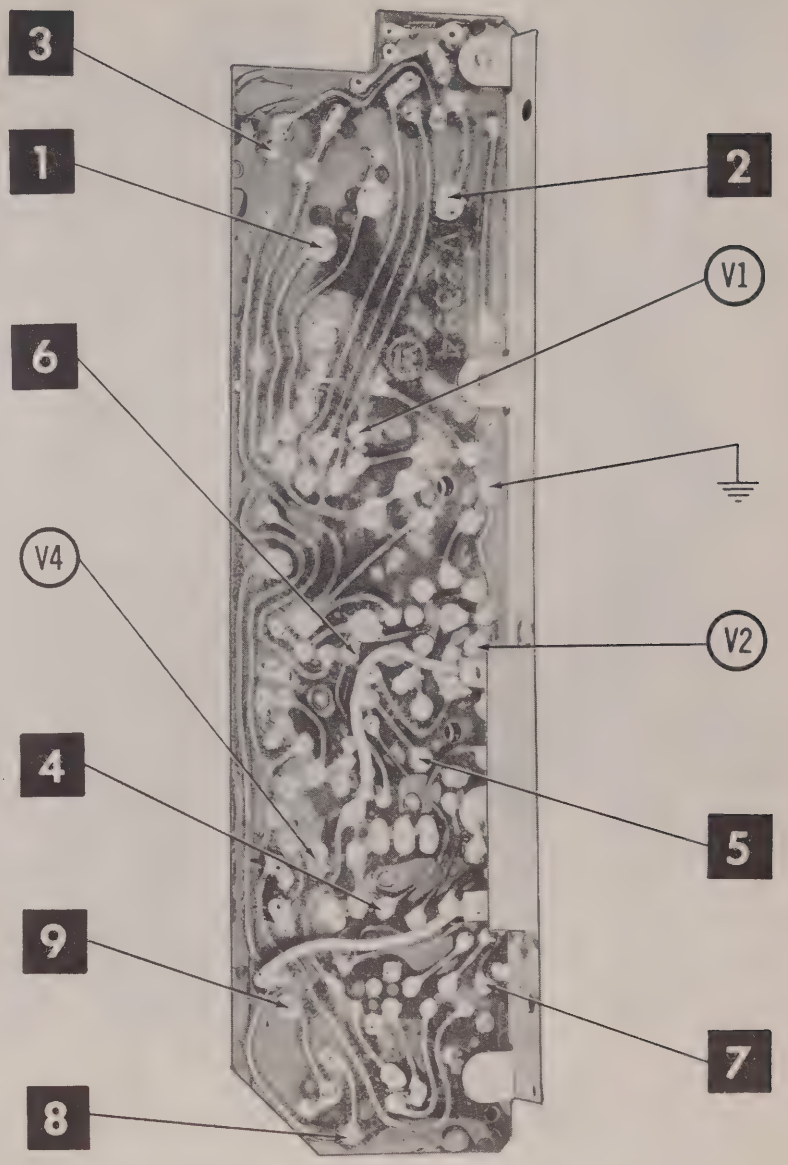
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	9600Ω	3-4Ω	Part of SP1		A-2998		A-3329	24S83	S-11X	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	570V050H01 ①	4A07	① Includes T1

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Circuit	120mmf, 47000mmf, 10000mmf, 170mmf, 1000mmf, 5900mmf, 3.3meg, 6.8meg, 3.3meg, 3.3meg, 1meg, 270Ω, 680Ω	219V026H01	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Westinghouse PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.057A	295V014H01	1234AH	T065 SD-94 ①	65S K200 ①	① Silicon Type

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M2	9V		D6		707		M-1603		
M3	90V			P60		479		M214	

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuning Cap.	330V014H02	2 Gang, Chassis V-2394-1
	Tuning Cap.	330V008H03	2 Gang, Chassis V-2394-2
M5	Switch	756V030H01	AC/DC-Battery, 3PDT, Spring Return, Slide Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

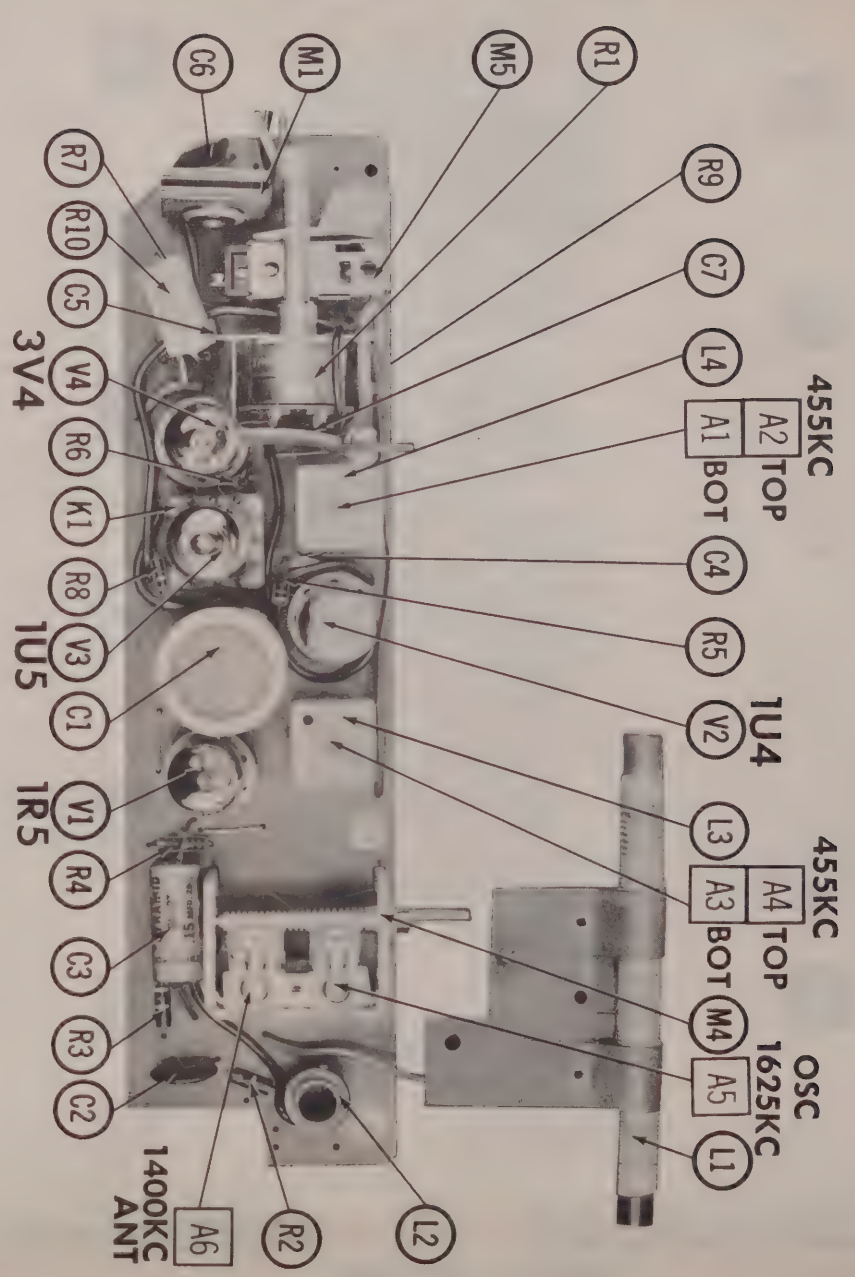
NAME	PART NO.	DESCRIPTION
Knob	550V088H02	Tuning, Models H-659P4, H-660P4
Knob	550V088H01	Tuning, Models H-662P4, H-663P4, H-664P4
Knob	550V096H02	Volume-On-Off, Models H-659P4, H-660P4
Knob	550V096H01	Volume-On-Off, Models H-662P4, H-663P4, H-664P4
Knob	550V087H01	Dial, Models H-662P4, H-663P4, H-664P4
Cabinet Assembly	513V028H01	Model H-659P4
Cabinet Assembly	513V028H02	Model H-660P4
Cabinet	513V028H03	Model H-662P4
Cabinet	513V028H04	Model H-663P4
Cabinet	513V028H05	Model H-664P4
Handle	558V159H01	
Antenna	318V004H01	Telescoping, Models H-662P4, H-663P4, H-664P4

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

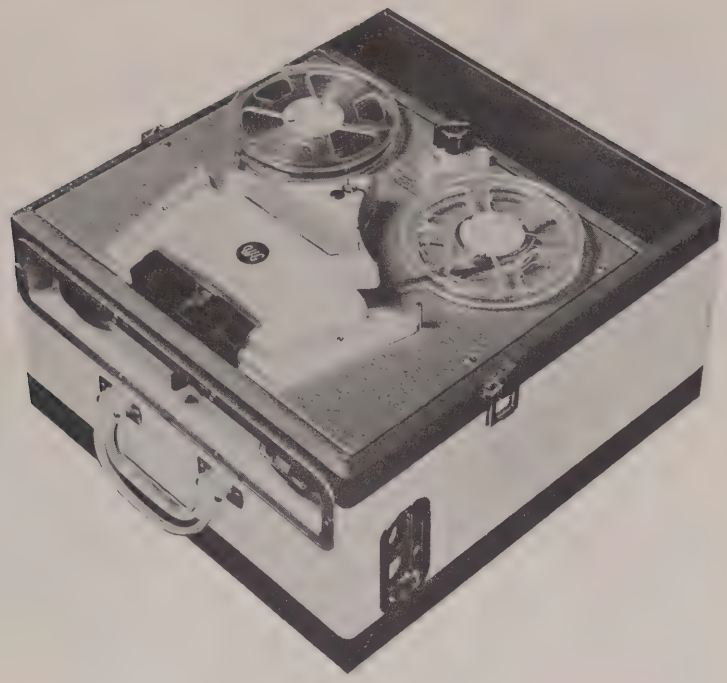
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—TOP VIEW



PHOTOFACT* Folder

WILCOX-GAY MODELS
702, 712, 732, 752



GENERAL INFORMATION

Wilcox-Gay Recordio Models 702, 712, 732, and 752 tape recorders feature push-button controls for each mode of operation.

Dual-track recording gives two full-length recordings on a reel of tape. Any size reel up to 7" can be used. Two neon record level indicators simplify the recording level setting.

New recordings can be made on previously recorded tape since the erase head is automatically positioned when Record button is depressed. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from a microphone.

These models have two tape speeds, 7 1/2 and 3 3/4 ips. Using both tracks of tape, recording time is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 Hour	1/2 Hour
7" (1200 ft.)	2 Hours	1 Hour

These tape recorders operate on 60 cycles, 117 volts AC only. Before connecting to line supply, be absolutely certain it agrees with the foregoing specifications. The recorders will be severly damaged if connected to a direct current (DC) line.

Manufactured by:
Wilcox-Gay Corporation
Charlotte, Michigan

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

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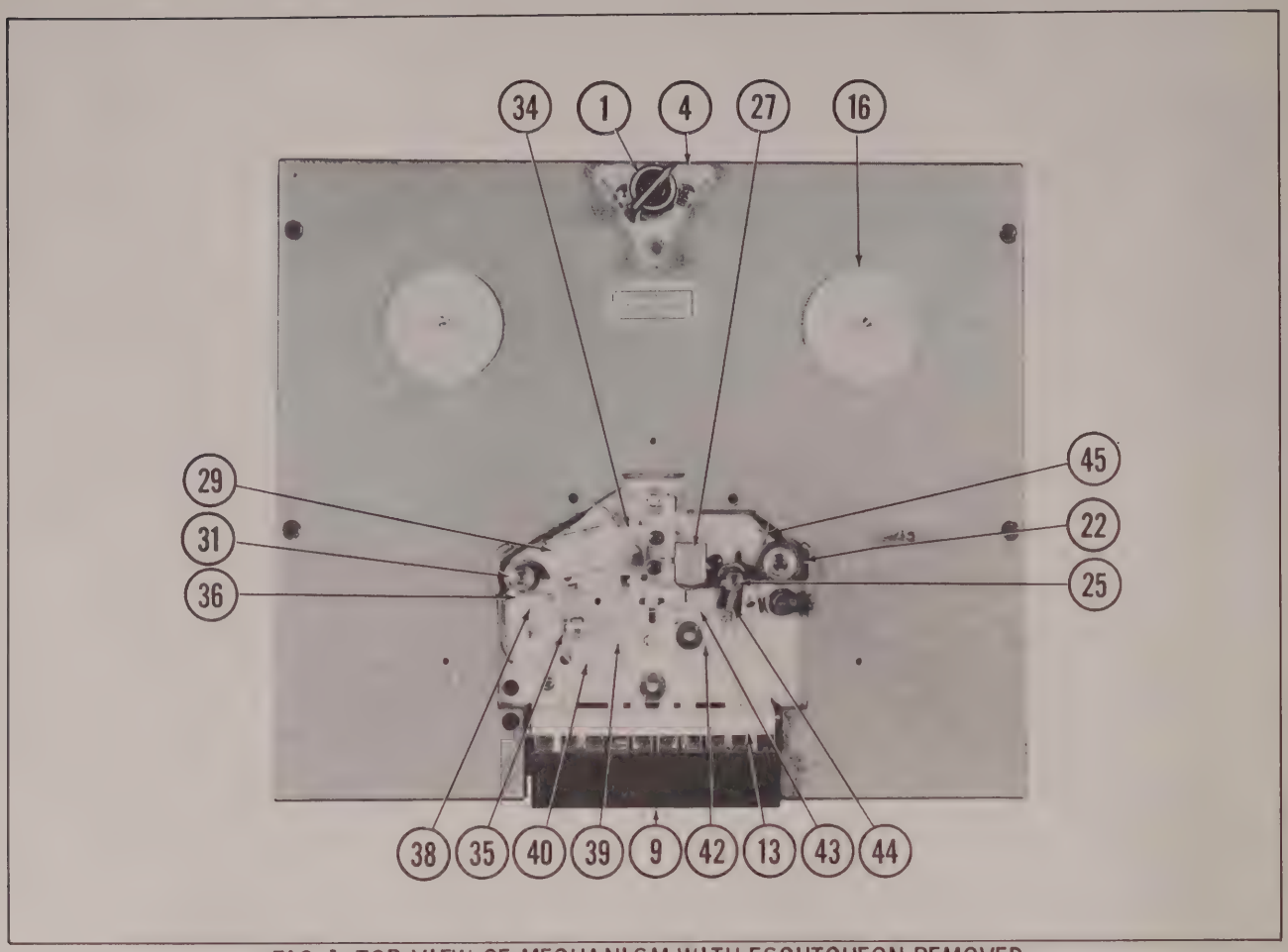


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED

PREPARING FOR OPERATION

1. Remove AC cord, reel of tape, empty reel, and microphone from case storage compartment.
2. Depress Stop button.
3. Insert AC cord into a convenient wall receptacle of proper rating and into AC input on cabinet.
4. Set speed change knob to 3 3/4 or 7 1/2 ips as desired.

CAUTION: Do not turn speed change knob unless Stop button is depressed.

When Forward or Rewind buttons are depressed, Record and Play buttons are locked and cannot be depressed, thus eliminating possible tape spillage. Buttons should always be depressed firmly until they latch. Stop button must be depressed before changing functions or speeds.

IMPORTANT: Always depress Stop button when tape recorder is not in use.

FUNCTION OF CONTROLS

High-Speed Forward or Rewind

To play a certain portion of tape over again, the entire reel need not be rewound. By depressing Forward or Rewind button, tape will advance or reverse rapidly.

Several minutes of normal recording can be skipped in a few seconds by using Forward and Rewind buttons.

Record

This control is used to record any sound being fed to tape from microphone, radio, television, or phonograph. Record button must be depressed while holding record lock to the left.

Play

This control is used to play back any sound on tape.

Stop

This control is used to stop the recorder from either Play, Record, Rewind, or Forward. It is a safety measure and must be depressed when tape recorder is not in use.

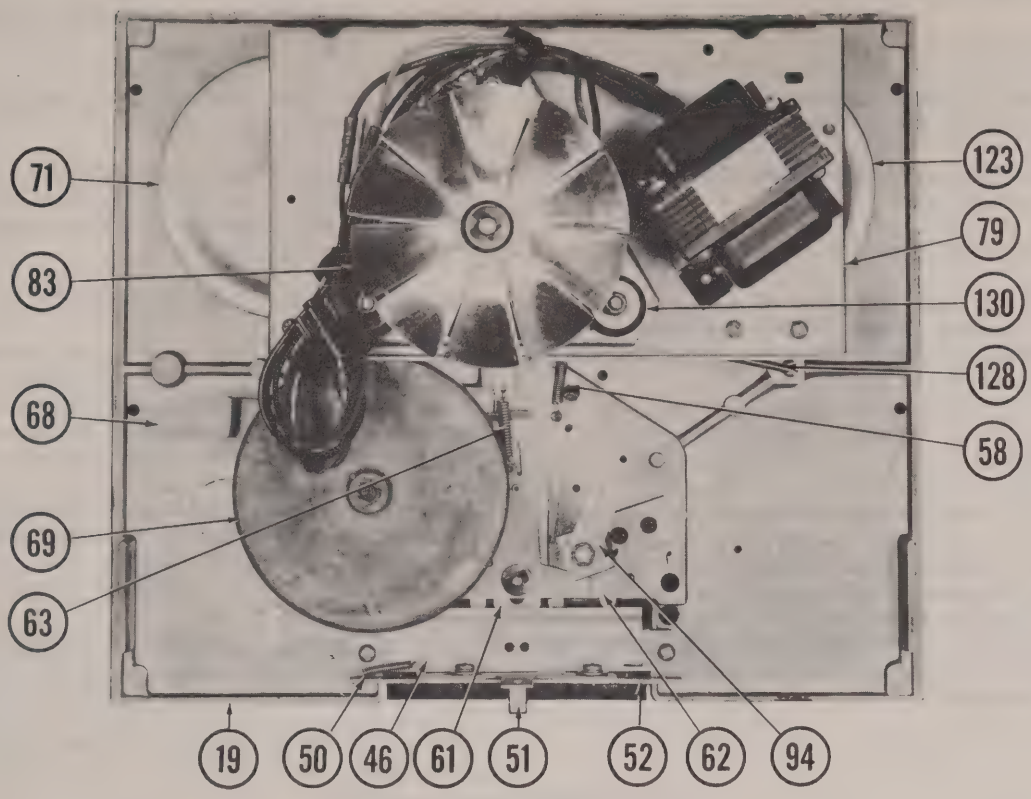


FIG. 2 BOTTOM VIEW OF MECHANISM

OPERATING INSTRUCTIONS

Threading Tape

1. Place a reel of tape on supply reel pan, making certain reel slots engage protrusions on pan. Place an empty reel on take-up reel pan, again making certain reel slots engage protrusions on pan.

2. Unwind about 14" of tape from supply reel. Hold a section of tape taut and insert into tape slot, making sure dull-coated side of tape faces away from operator.

3. Insert free end of tape into one of three slots in hub of take-up reel. While holding end of tape in place, give reel two or three turns to secure tape to reel.

To Record from Microphone

1. Turn On-Off switch to left and allow sufficient time for unit to warm up. Left neon light will glow when unit is on.

2. Move Record Lock knob to left, releasing the safety lock. This lock prevents accidental erasure.

3. Depress Record button while holding Record Lock knob to left until Record button latches.

4. Adjust Loudness control until right-hand neon indicator glows as brightly as left-hand indicator. If Loudness control is set too high, left-hand indicator will not light, causing distortion. For proper recording level, both neon indicators should glow.

5. Tone control is automatically disconnected while a recording is being made. When recording from a radio, set radio tone control for maximum treble.

6. Auxiliary switch on Tone control may be operated at any time during recording to monitor the recording. This allows tape recorder speaker to operate while a recording is being made. Keep microphone far enough from recorder to prevent acoustic feedback squeal.

To Record from Radio, Television Receiver, or Phonograph

1. Insert phonograph phono plug into Radio-PA-Phono input.

2. For radio or television recording, connect patch cord (part No. C20.233) to voice-coil terminals of radio or television receiver speaker with alligator clips. Plug into Radio-PA-Phono jack.

3. Proceed with recording as described under "To Record from Microphone."

NOTE: Remove patch cord from Radio-PA-Phono jack after recording is completed.

To Use Second Track

1. Depress Stop button after all of tape has been wound onto take-up reel.
2. Remove reel with tape and place on left-hand (supply) pan.
3. Place empty reel on right-hand (take-up) pan.
4. Thread tape and proceed with recording as described under "To Record from Microphone" or "To Record from Radio, Television Receiver, or Phonograph."

To Erase Tape

When Record button is depressed, erase head is automatically positioned, erasing any previous recording while a new one is being made. Material no longer needed may be erased, without recording, by depressing Record button and turning Loudness control to minimum volume. One track is erased at a time. To erase second track, reverse reels and repeat the foregoing prodedure.

To Play Recordings

1. Thread tape as described under "Threading Tape."
2. Set Speed Change knob to speed at which recording was made.
3. Depress Play button until it latches.
4. Adjust Loudness and Tone controls for desired listening level.

To Use as a Public Address System

To use recorder as a public address system, plug in an extension speaker or speakers, depress Record button, and set Volume and Tone controls to desired level. A recording can be made at the same time with tape placed on unit in normal manner.

CAUTION: Place microphone far enough from speaker or speakers to prevent acoustic feedback squeal.

Splicing Tape

Cut ends at a slight diagonal, butt ends together, and join them with a small piece of splicing tape on glossy side. Trim excess width.

DISASSEMBLY INSTRUCTIONS

To Remove Unit from Case

1. Remove four Phillips head screws from top plate.
2. Remove push-on type Record Lock knob.
3. Remove six Phillips wood screws from control escutcheon on front of case. Remove escutcheon.
4. Lift unit out of case, removing speaker plug from amplifier chassis before removing unit completely.

To Remove Amplifier from Transport Mechanism

1. Remove motor and power transformer plug from amplifier chassis.
2. Remove two head leads from play-record head.
3. Remove two slotted-head machine screws from each end of amplifier chassis.
4. Carefully lift amplifier away from transport mechanism and disconnect play-record switch actuating link.

MECHANICAL ADJUSTMENTS

Pressure Pad

1. Remove front escutcheon (8).
2. Depress Play button. Do not turn tape recorder on.
3. With a pencil-type postal scale, check the pressure needed to pull right-hand pad away from play-record head. Test should be made at end of pressure pad mounting spring. If necessary, adjust locked adjustment screw (39) until a reading of 1 3/4 oz. $\pm$ 1/4 oz. is obtained.
4. Guide post pressure pad (left-hand pad) is adjusted by bending pressure pad spring (38). The pad must be adjusted for minimum pressure against tape.

After adjustments are made, depress Stop button and replace front escutcheon.

Erase Head

1. With tape properly threaded, turn recorder on and depress Record button. Allow tape to run a few seconds; then turn recorder off, but leave Record button depressed.
2. With timer escutcheon (6) and front escutcheon (8) removed, check erase head (29) to see if it is parallel with tape.

3. Check to see if top edge of tape coincides with top end of diagonal slot in erase head (junction of long diagonal slot and short vertical slot). To adjust tape level, loosen set screw (30) and rotate left tape guide post (31) to move tape up or down.

Brake Shoe

1. With all push buttons raised, brake pads (131) should clear brake drums (71) and (123) by approximately 1/ 8".

2. Depress Stop button while observing brake pads. Both brake pads must contact brake drums at same time and with equal pressure.

3. If necessary, adjust by bending brake spring (64).

ELECTRICAL ADJUSTMENTS

Record Hum

Place unit in Record position, with volume at maximum and tone at full bass. Short out bias at L1. Connect a VTVM to External Speaker jack. Set VTVM to AC volts, 3-volt scale, with a 3. 3-ohm load resistor across meter. Adjust record hum control R2A for minimum deflection on meter.

Head Alignment

Use standard 6-kc or 12-kc alignment tape. Remove front and rear escutcheons. Clean pole pieces of play-record head with a good commercial head cleaning agent, naptha, or lighter fluid. Then proceed as follows:

1. Thread alignment tape on recorder and turn volume on full, with tone at full treble. Connect VTVM to External Speaker jack. Set meter for AC volts, 3-volt range.

2. Place unit in Play position at 7 1/ 2" speed. Decrease volume until output is 1 volt on meter. Rotate play-record head adjustment screw (26) until maximum point of deflection is found.

3. Gently press pressure pad at point to extreme right of play-record head. Output should not increase. If a gain is noted, slightly readjust pressure pad (see "Pressure Pad" under "Mechanical Adjustments").

Indicator Light (Normal and Overload)

Normal and Overload indicator lights are preset, and there are no firing adjustments. If either light must be changed, both lights should be replaced with a matched set of neon indicators to insure proper recording level indication.

Bias

1. Set line voltage at 117 volts.

2. Place unit in Record position and turn Loudness control to maximum volume.

3. Connect VTVM between ground and pin 7 of V2. Place meter selector on AC volts, 10-volt range.

4. Adjust trimmer C9 for 2 volts on meter.

LUBRICATION

All rotating parts have factory-lubricated oilite bearings. With normal usage, no further lubrication is necessary. In heavy-duty service, the following parts should be lubricated once a year with a drop of #10 motor oil:

1. Top and bottom motor bearings.

2. Capstan bearing.

3. Pinch roller (22) bearing.

4. All idler and drive wheel bearings.

5. Reel spindle bearings.

Do not overlubricate. Keep oil off all rubber idlers, belts, and flywheel periphery, and any parts that might transfer oil to them. Always wipe excess lubricant from lubricated parts.

Ocassionally clean out the foreign matter under plastic push-button cover, and place a drop of oil on sliding lever.

CLEANING

Most defects, other than wear or breakage, can be traced to dirty surfaces. Play-record head (27), capstan, and pinch roller (22) may accumulate tape coating oxide, worn off tape as it passes these parts. This accumulation should be removed periodically since it will cause faint recording and poor playback. Wipe above surfaces carefully with a clean cloth. If dirt is caked or hard and cannot be removed with a dry cloth, dampen cloth slightly with alcohol.

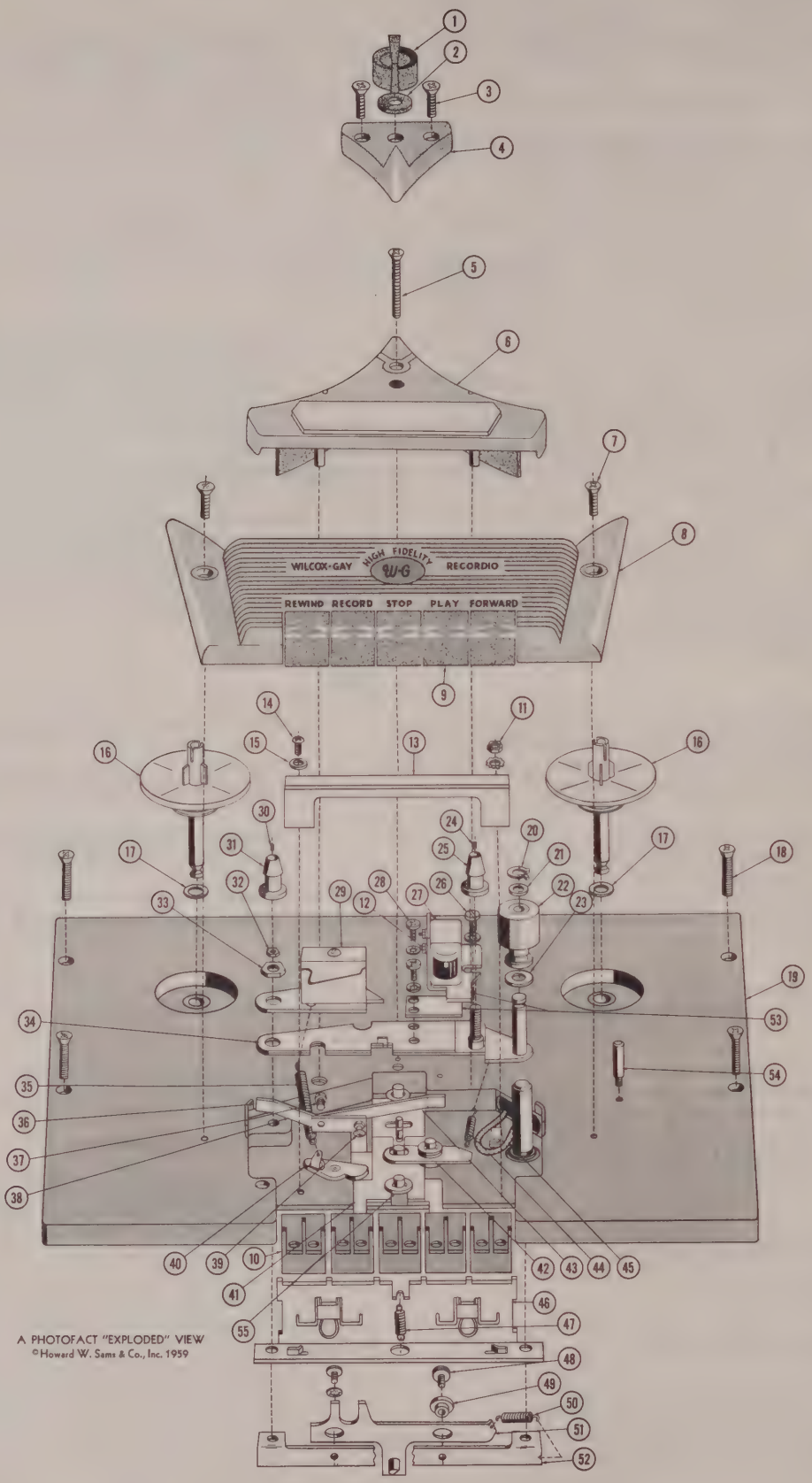


FIG. 3A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

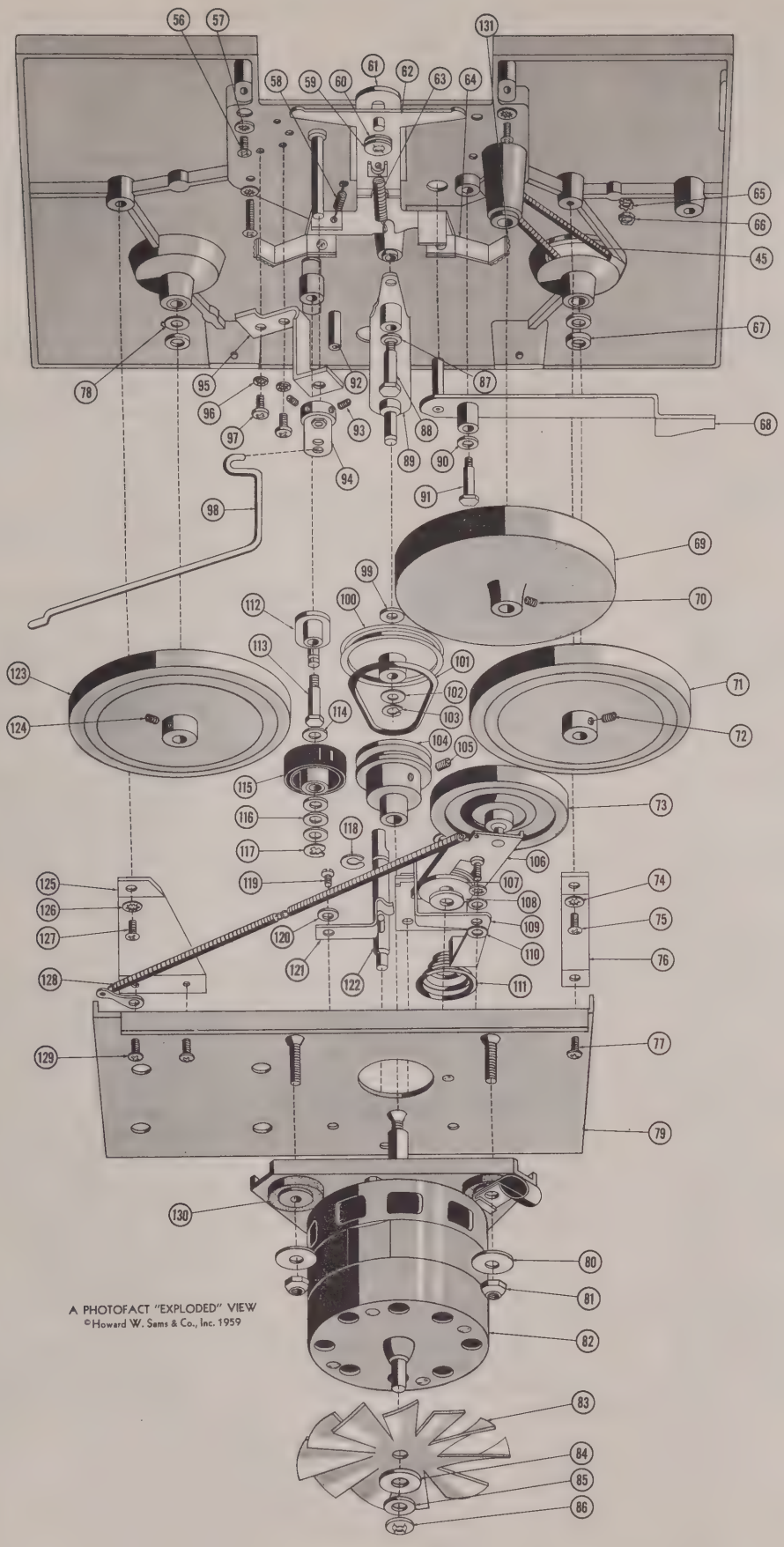


FIG. 3B EXPLODED VIEW OF PARTS BELOW BASEPLATE

TROUBLE CHART

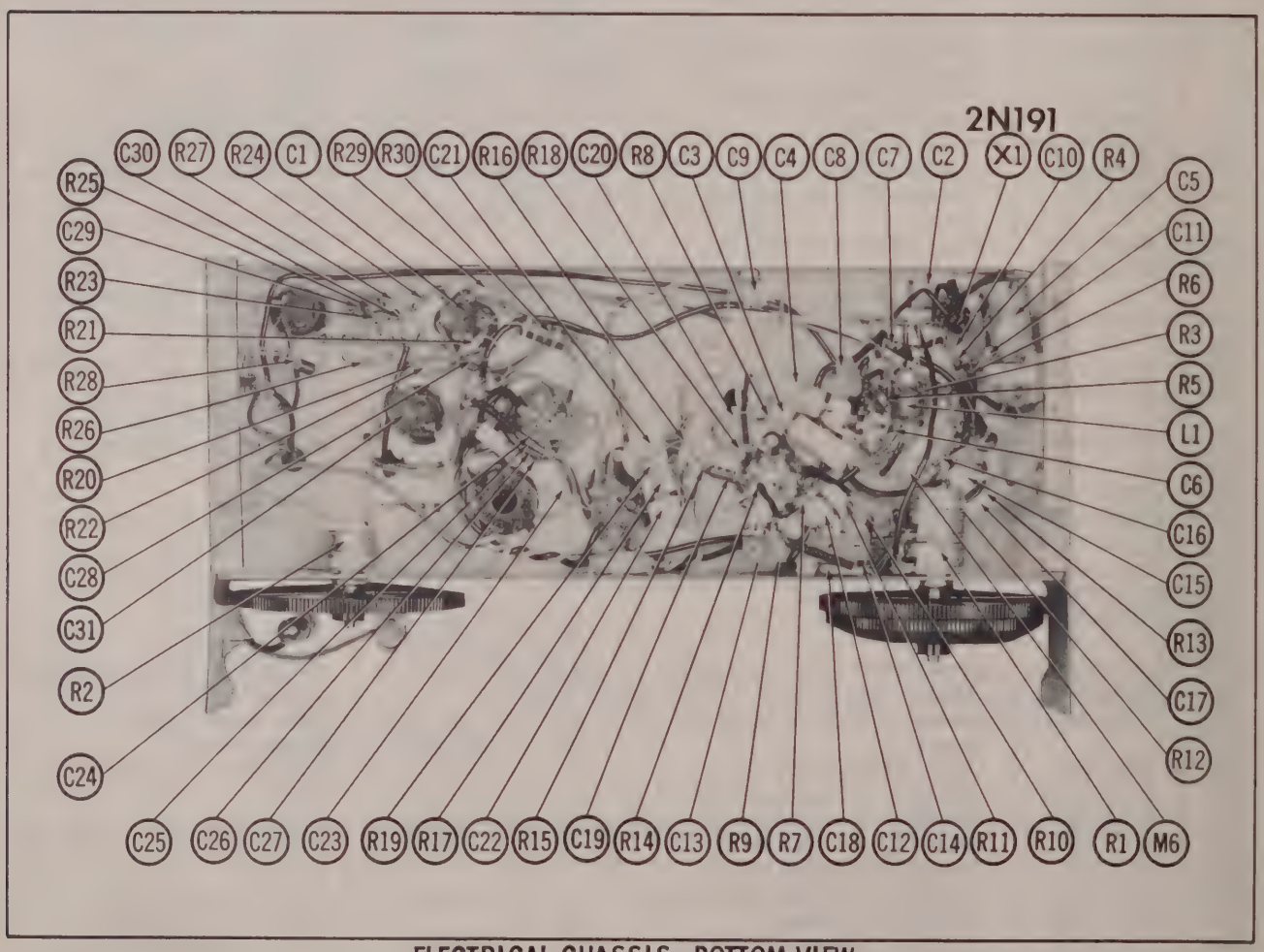
Symptom	Cause	Remedy
Push buttons do not latch.	1. Lock plate spring (47) disconnected or broken.	1. Connect or replace lock plate spring (47).
No drive in Play or Record.	1. Idler tension spring (128) disconnected or broken. 2. Idler slide plate (106) binding on idler slide bushing (107), thus preventing idler wheel (73) from moving forward.	1. Connect or replace idler tension spring (128). 2. Check idler slide plate (106) and idler slide bushing (107) for burrs; clean with alcohol.
Tape does not wind onto take-up reel during Play or Record.	1. Reel drive spring (45) loose, disconnected, or broken. 2. Nylon reel pan (16) shaft binding.	1. Connect or replace reel drive spring (45). 2. Remove foreign matter from bearing surface and shaft with a clean cloth. Lubricate with one drop of #10 motor oil.
No fast forward or rewind.	1. Idler lever tension spring (128) disconnected or broken, thereby not actuating idler lever (89). 2. Idler drive belt (101) broken or not connected properly.	1. Connect or replace idler lever tension spring (128). 2. Replace idler drive belt (101).
Tape spills when Stop button is depressed during fast forward or rewind.	1. Brake shoes out of alignment. 2. Brake pads (131) worn out or missing.	1. See "Brake Shoes" under "Mechanical Adjustments." 2. Replace brake pads (131).
Wow.	1. Brake return spring (58) disconnected or broken. 2. Oil or foreign matter on driving surfaces.	1. Connect or replace brake return spring. (58). 2. Clean driving surfaces with a cloth and alcohol.
Flutter	1. Dirty play-record head (27), pressure pads, capstan shaft, or pinch roller (22).	1. Clean as described under "Cleaning."
No erase, or incomplete erase.	1. Erase head tension spring (35) disconnected or broken. 2. Erase head (29) not properly adjusted.	1. Connect or replace erase head tension spring (35). 2. See "Erase Head" under "Mechanical Adjustment."
Does not record.	1. Faulty microphone or cord. 2. Faulty input jack. 3. Faulty tube. 4. Low bias voltage. 5. Open play-record head (27).	1. Replace, if necessary, after checking recorder with another type of input. 2. Replace input jack, if necessary. 3. Replace any defective tubes. 4. See "Bias" under "Electrical Adjustments." 5. Check continuity. After checking continuity, demagnetize head.
Motor and amplifier do not operate.	1. Defective power supply. 2. Damaged power cord. 3. Defective On-Off switch.	1. Check voltages per schematic. 2. Repair or replace power cord. 3. Replace On-Off switch.

Ref. No.	Part No.	Description
1	C-13.253-7	Speed Shift Knob
2	73-2254-3	Felt Washer, 3/4 O.D. x 1/4 I.D. x 1/16
3	57-4C-610-5	#6-32 x 5/8 O.H.M.S., Phillips
4	C-13.360	Speed Shift Escutcheon
5	57-4C-624-5	#6-32 x 1 1/2 O.H.M.S., Phillips
6	D-13.363	Timer Escutcheon
7	57-4C-610-5	#6-32 x 5/8 O.H.M.S., Phillips
8	E-13.364	Front Escutcheon
9	B-35.1043-1	Push Button Ass'y. (Black)
10	B-19.876-1	Push Button Lever
11	48-2219-1	#6-32 x 5/16 Keps Hex. Nut
12		#2-56 x 3/16 Hex. Nut
13	B-19.858	Push Button Retaining Brkt.
14	57-4C-610-5	#6-32 x 5/8 O.H.M.S. Phillips
15	73-2231-4	#6 Int. Lockwasher
16	C-13.318-0	Nylon Reel Pan & Shaft Assy.
17	B-28.163	Linen Washer
18	57-4C-816-5	#8-32 x 1 O.H.M.S. Phillips
19	B-35.1055-3	Base Plate Ass'y. (Blue) (Model 732)
	B-35.1055-1	Base Plate Ass'y. . (Brown) (Model 702)
	B-35.1055-2	Base Plate Ass'y. (Blue) (Model 712)
	B-35.1055-4	Base Plate Ass'y. (Green) (Model 752)
20		"E" Ring, 3/16" Shaft
21	B-28.163	Linen Washer
22	B-33.404	Pinch Roller
23	B-28.163	Linen Washer
24	57-3439	#6-32 x 3/16 Bristol Hd. Set Screw
25	B-32.282	Tape Guide Post (Right)
26	57-3102-1	#4-36 x 1/4 R.H.M.S. (Azimuth Adj.)
27	B-36.212	Play-Record Head
28		Head Mtg. Screw
29	B-35.1048	Erase Head Ass'y.
30	57-3439	#6-32 x 3/16 Bristol Hd. Set Screw
31	B-32.300	Tape Guide Post (Left)
32	48-410-1	#6-32 Hex. Nut
33	B-32.260	Tape Guide Post Spacer
34	C-35.1067	Pinch Roller & Record Head Ass'y.
35	B-31.361	Erase Head Tension Spring
36	B-31.334	Felt Pad (2 Used)
37	57-1C-603-2	#6-32 x 3/16 B.H.M.S., Phillips
38	B-35.1047-1	Pressure Pad Spring Ass'y.
39	57-16C-606-1	#6-32 x 3/8 R.H.M.S.
40	B-35.1025-1	Record Actuating Lever Ass'y.
41	B-19.868	Record Slide Plate
42	B-19.881	Playback Actuating Lever
43	B-35.1047-1	Pressure Pad Spring Ass'y.
44	B-31.360	Pinch Roller Tension Spring
45	B-31.351	Reel Drive Spring (Belt)
46	B-19.859-1	Hinge Bracket for Push Button
47	B-31.343	Lock Plate Spring
48	57-3576-1	#8-32 x 1/4 Sems. P.H.M.S.

Ref. No.	Part No.	Description
49	B-32.291	Shouldered Washer
50	B-31.427	Record Lock Return Spring
51	B-35.1023	Record Lock Ass'y.
52	B-19.1364-1	Record Lock Mtg. Plate
53	B-35.1063	Play-Record Head Bracket Ass'y.
54	B-32.373	Tape Guide Post
55	B-33.412	Push-On Stud Nut, 3/16 "Stud
56	57-6C-805-1	#8-32 x 5/16 R.H.M.S. Phillips
57	73-2231-5	#8 Int. Lockwasher
58	B-31.338	Brake Return Spring
59	B-33.412	Push-On Stud Nut, 3/16" Stud
60	73-2241-148F	Flat Washer, 1/2 O.D. x .205 I.D. x 1/32
61	C-35.835	Brake Slide Plate Ass'y.
62	B-35.1046-1	Shift Plate Ass'y.
63	B-31.339	Idler Lever Tension Spring
64	B-35.1070	Brake Spring Ass'y.
65	73-2231-4	#6 Int. Lockwasher
66		#6-32 x 1/4 Hex. Nut
67	73-2248-39	Flat Washer, .425 O.D. x .255 I.D. x .070 Phenol
68		Lever Assembly
69	C-13.257-1	Flywheel
70	57-3589-1	#8-32 x 1/4 Bristol Hd. Set Screw
71	B-35.1050-1	Brake Drum & Bushing Ass'y.
72	57-3589-1	#8-32 x 1/4 Bristol Hd. Set Screw
73	B-33.408	Idler Wheel, 2 1/2" Dia.
74	73-2231-5	#8 Int. Lockwasher
75	57-6C-805-1	#8-32 x 5/16 R.H.M.S., Phillips
76	B-19.862	Angle Brkt. for Mtg. Drive Ass'y.
77	57-6C-805-1	#8-32 x 5/16 R.H.M.S., Phillips
78	B-28.163	Linen Washer
79	B-35.1054-2	Drive Mtg. Plate Ass'y.
80	B-33.411	Flat Washer, 3/4 O.D. x 3/16 I.D. x .050
81	48-2221	#10-32 Hex. Nut (Elastic Stop Nut)
82	D-36.153	Motor Round Type Fasco
	D-36.154	Motor Square Type G.I. & Alliance
83	C-19-887-1	Fan Blade
84	73-2254-3	Felt Washer, 3/4 O.D. x 1/4 I.D. x 1/16
85	73-2241-143	Flat Washer, 5/8 O.D. x .260 I.D. x 1/32
86	33.415	Speed Nut
87	B-31.382	Spring Washer
88	B-32.275-1	#8-32 Hex. Hd. Shouldered . Screw
89	B-35.1051-1	Idler Lever Ass'y.
90	B-31.382	Spring Washer
91	B-32.275-1	#8-32 Hex. Hd. Shouldered Screw
92	B-33.118	Spacer
93	57-3439	#6-32 x 3/16 Bristol Hd. Set Screw
94	B-35.1033	Switch Lever Ass'y.
95		Switch Lever Bracket
96	73-2231-4	#6 Int. Lockwasher

Ref. No.	Part No.	Description
97		#6-32 x 1/4 B.H.M.S., Phillips, Brz.
98	B-19.1379-1	Switch Arm Link
99	B-28.163	Linen Washer
100	B-35.1066	Sheave Pulley Ass'y.
101	B-28.181	Idler Drive Belt
102	B-28.163	Linen Washer
103		"E" Ring, 3/16" Shaft
104	B-32.288	Motor Pulley
105	57-3589-1	#8-32 x 1/4 Bristol Hd. Set Screw
106	B-35.1064	Idler Slide Plate Ass'y.
107	B-32.264	Idler Slide Bushing
108		Flat Washer, Steel
109	110-47	Idler Throw Out Lever
110	B-32.291-1	Shouldered Washer
111	B-31.327	Idler Lift Compression Spring
112	B-35.1044-1	Sub-Idler Plate Ass'y.
113	B-32.275-1	#8-32 Hex. Hd. Shouldered Screw
114	B-28.163	Linen Washer

Ref. No.	Part No.	Description
115	B-33.405	Sub Idler Wheel
116	73-2254-6	Felt Washer
117		"E" Ring, 3/16" Shaft
118	B-33.407-1	"C" Washer
119	57-1C-603-2	#6-32 x 3/16 B.H.M.S., Phillips
120	73-2231-4	#6 Int. Lockwasher
121	B-19.961	Detent Spring
122	B-35.1021-1	Speed Control Shaft Ass'y.
123	B-35.1050-1	Brake Drum & Bushing Ass'y.
124	57-3589-1	#8-32 x 1/4 Bristol Hd. Set Screw
125	B-19.863	Drive Mtg. Plate Bracket
126	73-2231-5	#8 Int. Lockwasher
127	57-6C-805-1	#8-32 x 5/16 R.H.M.S., Phillips
128	B-31.324	Idler Tension Springs
129	57-6C-805-1	#8-32 x 5/16 R.H.M.S., Phillips
130	B-28.159	Shock Mount
131	B-31.335	Brake Pad, Felt



ELECTRICAL CHASSIS - BOTTOM VIEW

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1 V2	AF Amp. Output	12AX7/ ECC83 6AQ5	
V3	Rectifier	6X4	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	2N191	Playback Pre Amp. -Bias Osc.					PNP Note 1

Note 1. Early versions may use 2N133 or GT20.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT.	Wilcox-Gay PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450	C-5.421-7	AFH4-67	D0520	FP444	TMQ-83	Q-340	TVL-4724.2
B	▲20	450							
C	■20	450							
D	20	25							
C2	50	6	B-5.448 ①	SRE6V50	BBR50-6	TT6X50	TD-50-6	MQ-650	TVA-1100
C3	50	6	B-5.448	SRE6V50	BBR50-6	TT6X50	TD-50-6	MQ-650	TVA-1100
C4	50	6	B-5.448	SRE6V50	BBR50-6	TT6X50	TD-50-6	MQ-650	TVA-1100

① Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	Wilcox-Gay PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	.5	100	D-3.100-33	P288N-5		CUB2P5	GEM-205	2TM-P5	①
C6	470		C-4.151-2	1469-00047	MD-471	5RST47		MS-347	10%
C7	2000		C-4.109-42						10%
C8	10000		C-4.115-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C9	10-160		B-4.152						
C10	10000		C-4.115-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C11	470		C-4.109-41	SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C12	.047	400	4.148-58	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	50		C-4.151-1	1469-00005	DD-500	5R5Q5	MCE225	MS-45	10%
C14	1500		C-4.109-13						10%
C15	.033	400	D-4.148-56	P488N-033		CUB4S33	GEM-4133	4TM-S33	②
C16	100		C-4.109-40	SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C17	470		C-4.109-41	SI 470	D6-471	LT6T47	UC-5347	5GA-T47	
C18	20000		C-4.115-23	BPD-02	DD-203	BYB6S2		5HK-S2	
C19	100		C-4.109-40	SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C20	10000		C-4.115-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C21	10000		C-4.115-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C22	.047	400	4.148-58	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C23	1500		C-4.109-13						10%
C24	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	③
C25	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	③
C26	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	③
C27	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	③
C28	330		C-4.109-39		D6-331				10%
C29	10000		C-4.115-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C30	100		C-4.109-40	SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C31A	4000		B-4.131-2	BPD-2X004	DD-402	BYC6DD4	DCD524	5HK-2D4	
B	4000				DD-402				

① Not used in some versions.
② Some versions may use .02mfd 400V in this application. (Part #D-4.115-24)
③ Some versions may use a single 20000mmf to replace C24, C25, C26, & C27 (Part #C-4.115-23).

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	Wilcox-Gay PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2	B-11.252	F1-52			■ UE3835S	Loudness
B	250K	1/2		R2-35				Tone
C	Switch			~~KB-1~~ or KR-1*				
R2A	500Ω	1/2	B-8.240	AB-4	B47-500-S	B11-103	PTA52L	Hum Adjust
B	Shaft			AK-1	Not Req.	SK2	Not Req.	

■ "STA-LOC" Equivalent: FB16A, OF812, RU254A, IS1250, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	Wilcox-Gay PART No.	NOTES
R3	100K		D-7.101-100	Note 1
R4	10K		D-7.101-58	
R5	5600Ω		D-7.101-48	Note 2
R6	1000Ω		D-7.101-16	Note 1
R7	4.7meg		D-7.101-178	
R8	220K		D-7.101-114	
R9	100K		D-7.101-100	
R10	100K		D-7.101-100	
R11	10K		D-7.101-58	
R12	1meg		D-7.101-141	
R13	390K		D-7.101-125	
R14	47K		D-7.101-86	
R15	1meg		D-7.101-141	
R16	220K		D-7.101-114	

Note 1. Not used on some versions.
Note 2. Some versions may use 10K in this application (Part #D-7.101-58).

ITEM No.	RATING OHMS	WATT	Wilcox Gay PART No.	NOTES
R17	68K		D-7.101-93	
R18	2200Ω		D-7.101-30	
R19	470K		D-7.101-128	
R20	330Ω	1	D-7.102-2	
R21	220K		D-7.101-114	
R22	150K		D-7.101-107	
R23	10meg		D-7.101-191	
R24	4.7meg		D-7.101-178	
R25	10meg		D-7.101-191	
R26	1.5meg		D-7.101-148	
R27	1meg		D-7.101-141	
R28	3.3Ω		D-6.212-1	
R29	4700Ω	1	D-7.102-51	
R30	470Ω	1	D-7.102-9	

COILS (RF-IF)

ITEM No.	USE	Wilcox-Gay PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	B-1.557					Tapped ⓐ 14Ω

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	Wilcox-Gay PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .8A	420VCT ⓐ .032A	6.3V ⓐ1.2A	D-9.263-2	P9210	P-3147		PC8418	24R11U	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	Wilcox-Gay PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5200Ω	3-4Ω	C-9.264	Z1109	A-3019	AU-606	A-8092	26S49	S-5X	

SPEAKER

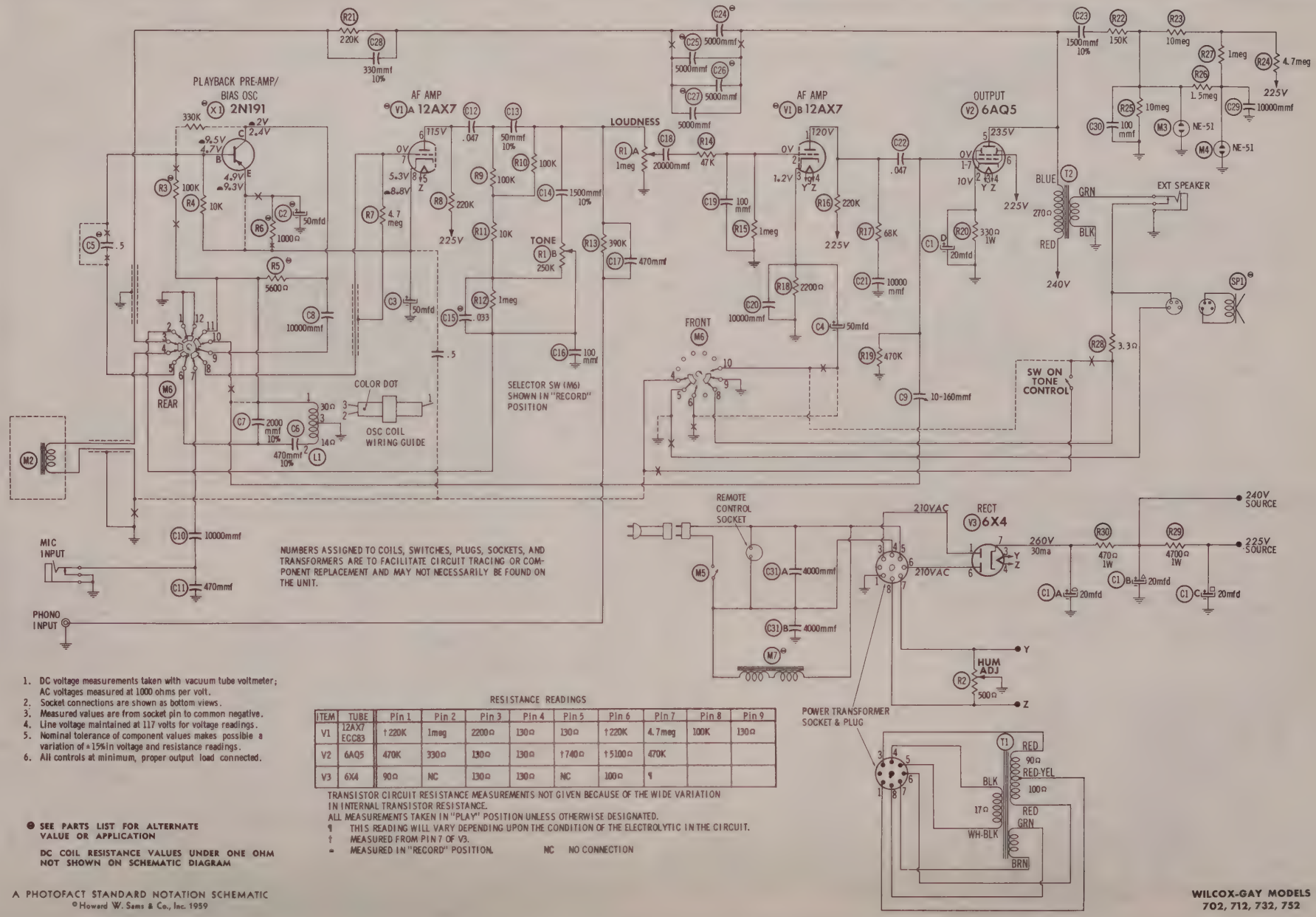
ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	Wilcox-Gay PART No.	QUAM PART No.	NOTES
SP1	4"x6"	PM	3-4Ω	C-30.354-1①	46A1	① Used in model 732
	5"x7"	PM	3-4Ω	C-30.355 ②	57A21	② Used in model 752
	4"	PM	3-4Ω	③		③ Used in Models 702, 712

MISCELLANEOUS

ITEM No.	PART NAME	Wilcox-Gay PART No.	NOTES
M1	Erase Head	B-35.1048	Assembly, includes permanent magnet head #C-35.756-1
M2	Record-Playback Head	B-36.212	
M3	Lamp	45-2036-1	NE51
M4	Lamp	45-2036-1	NE51
M5	Switch	B-11.250	Power, On-Off
M6	Switch	B-11.254B	Function (Rotary Wafer Type)
	Microphone	C-36.171-3	Models 732, 752
	Microphone	36.211	Models 702, 712

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7 ECC83	†220K	1meg	2200Ω	130Ω	130Ω	†220K	4.7meg	100K	130Ω
V2	6AQ5	470K	330Ω	130Ω	130Ω	†740Ω	†5100Ω	470K		
V3	6X4	90Ω	NC	130Ω	130Ω	NC	100Ω	¶		

TRANSISTOR CIRCUIT RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V3.
– MEASURED IN "RECORD" POSITION. NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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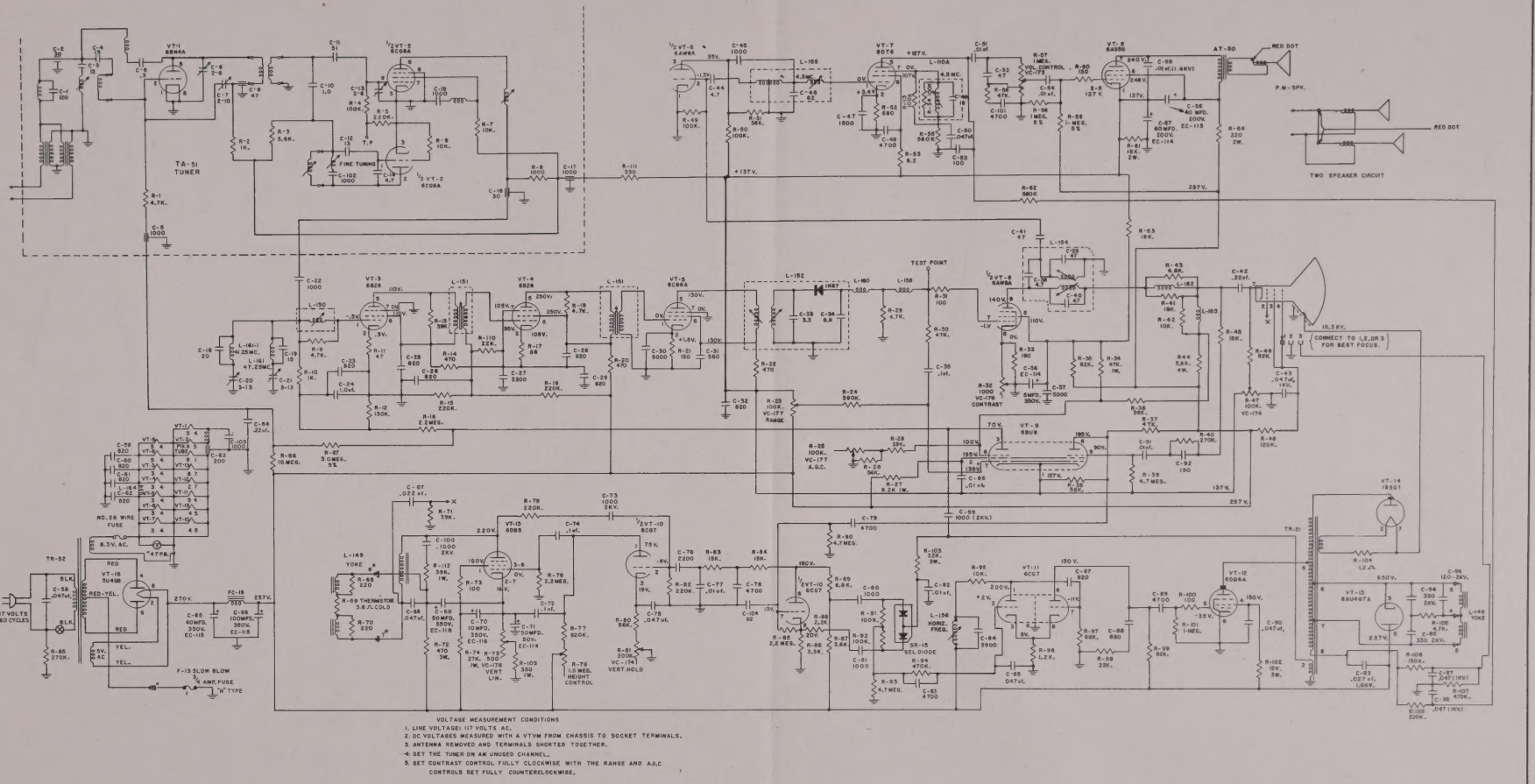
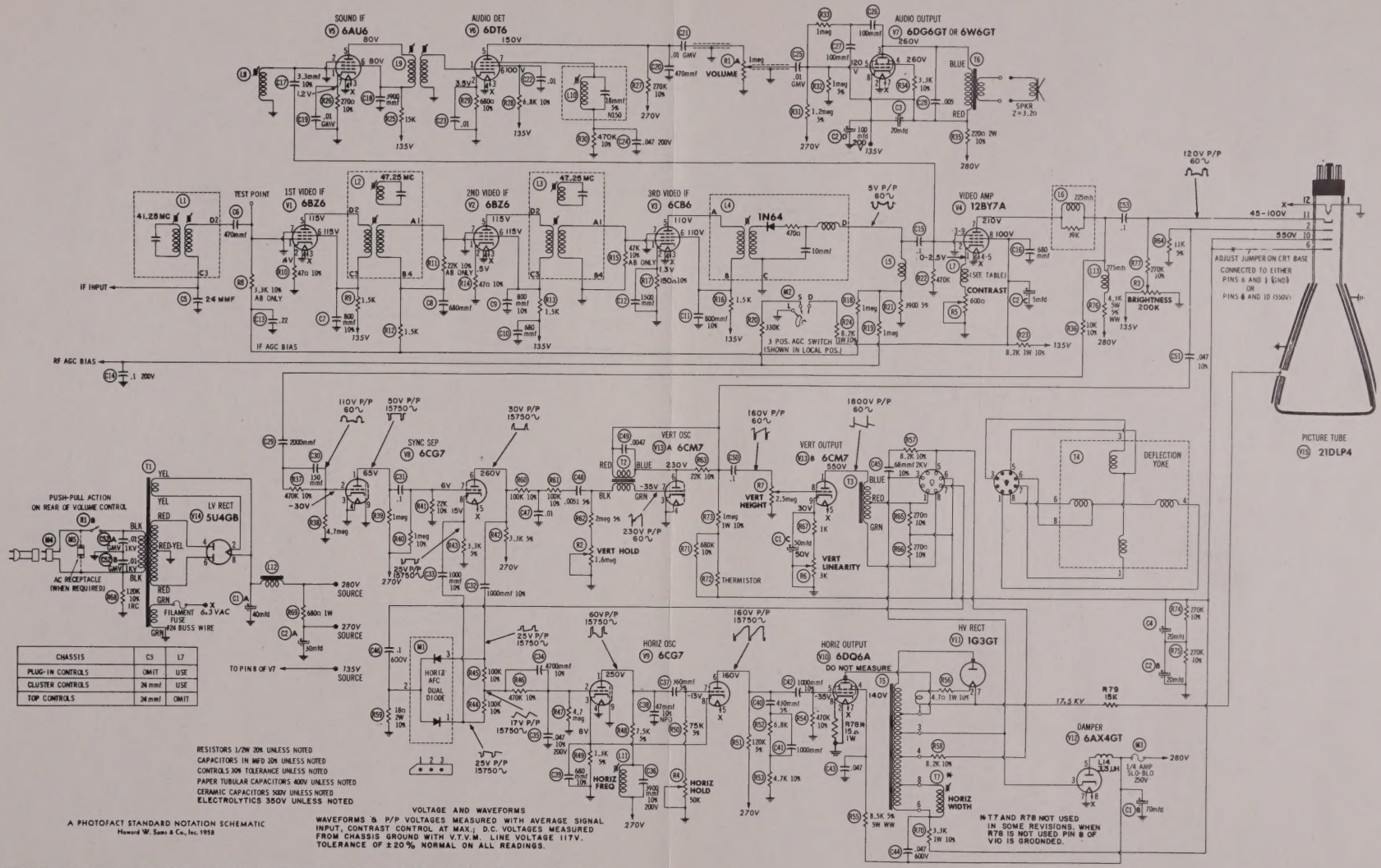
WILCOX-GAY MODELS
702, 712, 732, 752


TA-51 TUNER
FINE TUNING
TWO SPEAKER CIRCUIT
TEST POINT
VOLTAGE MEASUREMENT CONDITIONS
1. LINE VOLTAGE: 117 VOLTS AC.
2. DC VOLTAGES MEASURED WITH A VTVM FROM CHASSIS TO SOCKET TERMINALS.
3. ANTENNA REMOVED AND TERMINALS SHORTED TOGETHER.
4. SET THE TUNER ON AN UNUSED CHANNEL.
5. SET CONTRAST CONTROL FULLY CLOCKWISE WITH THE RANGE AND A.G.C CONTROLS SET FULLY COUNTERCLOCKWISE.

TRAV-LER MODELS 821-FT-900, U, 821-K-909, U, 821-K-910, U,
821-T-901, U, 821-T-905, U (Ch. 1051-19)

Schematic Diagram Courtesy of TRAV-LER RADIO CORP.



MAGNAVOX CHASSIS U28-0100, U28-0200, U28-0300, U28-0400, U28-0500, U28-0600, V28-0100, V28-0200, V28-0300, V28-0400, V28-0500, V28-0600 (28 Series)

Schematic Diagram Courtesy of MAGNAVOX CO.

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